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AMERICAN JOURNAL OF OPHTHALMOLOGY
Volume 15 July, 1932 Number 7

SOME BIOLOGICAL PRINCIPLES WHICH UNDERLIE OPHTHALMIC PLASTIC SURGERY

EDMUND B. SPAETH
PHILADELPHIA

The author presents most of the procedures used in correcting defects about the eyes and eyelids giving a workable description of method described with diagrams and photographs of illustrative cases. Free skin grafts, sliding grafts, pedicle flaps, mucous membrane, bone and cartilage grafts and the surgical principles and devices for their successful application are discussed. Proper protective dressings and correct postoperative care are outlined as important factors in securing desired results. Read before the Brooklyn Ophthalmological Society, December 19, 1931. From the Peter Ophthalmological Clinic, University of Pennsylvania, Graduate School of Medicine, Philadelphia.

In discussing the biological principles which underlie ophthalmic plastic surgery we must consider certain essential factors, some that are imperative for fulfillment and others as definitely contraindicated. Such factors are basic if success is to be attained.

Wilmer, in his foreword to a book on ophthalmic plastic surgery stated as follows, "No argument is required in order to convince the most casual observer that the destruction of sight is an irreparable catastrophy. But the tragedy that may lie in a distorted physiognomy is not as readily understood. Only one who realizes the 'mind's construction in the face' can appreciate the profound psychological effect upon the patient. To reconstruct such a deformity is to reconstruct the man by relieving him of the ever consciousness of 'one auspicious and one drooping eye,' as Shakespeare expresses it. No rehabilitation is more important or more far reaching in its results. Further, plastic surgery requires the most careful and painstaking study of each individual case before undertaking the actual operative procedure. Even the period of time that should lie between the injury and the operation, is a necessary consideration. The surgeon must possess to the fullest extent the conception of *'suaviter in modo, fortiter in re'*. He must possess great boldness in making the size of his flaps large, and the removal of all scar tissue thorough; yet at the same time he must practice the most rigid economy in sacrificing muscle tissue or normal skin. He must simulate the other side of the face as closely as possible, dynamically and statically. He must also be prepared to sacrifice the lachrymal gland if such a course is necessary. He must learn from the tailor the method of placing sutures without undue tension; from the carpenter, the fitting in and beveling of his flap; and from the sculptor, the restoration of the bony walls and overlying tissues. When one eyebrow has been destroyed, its fellow must share its ciliary contents, and when both are destroyed, even the back of the head must supply the necessary hairs to restore these important features. In bony deficiencies, denser substances, such as autogenous cartilage grafts, must supply the needed structure."

The surgical principles which underlie ophthalmic plastic surgery are as inflexible as those connected with opening the abdomen. Simply because the usual individual states that it is impossible to sterilize the skin or the conjunctival cul-de-sacs is no reason why careless practices are permissible. There is no reason for haste during the operation. Adequate time is necessary, for these cases are usually rather tedious.

Anesthesia. Whenever it is possible to use general anesthesia, it seems best to do so, for it simplifies the operation decidedly. On the other hand, in some cases, when it is necessary to reoperate several times, one is unwilling to subject the patient to general anesthesia more than is absolutely necessary. Careful block anesthesia in the infraorbital nerve, the supraorbital nerve, and the branches of the facial nerve, with the minimum of infiltration thereafter will allow one to do almost anything necessary with the soft tissues about the eye.

It is quite possible to resect rib cartilage under local anesthesia. It has been done repeatedly. When considerable bone work is necessary about the face the impact of the mallet on the chisel may be a bit unpleasant to the sensibilities of the average patient, but the operation itself can be quite painless. It is well to remember that block anesthesia should be used whenever possible and infiltration anesthesia as little as is possible. Block anesthesia will prevent gross distortion of anatomical landmarks, the masking of defects, and a minimization of the cicatricial deformity.

In so far as the age of the patient is concerned, there seems to be no limitation whatsoever in plastic surgery. The writer has operated upon an infant eight hours old, as well as upon an individual seventy years old, both with success.

Sterilization. Instruments are sterilized in the usual manner. Sea sponges, used for dressings, should be autoclaved after washing and may then be stored in a flask of sterile water until they are to be used. This will prevent their becoming hard and brittle for then they are useless. Formalized cartilage is to be removed from the formalin solution four days before the time for utilization, placed in a flask of sterile distilled water, and this water changed daily, or even twice daily, so that all preservative has been removed before the cartilage is used. Dental stent and dental wax should be sterilized in a 50 percent phenal solution, washed through alcohol to remove the phenol and then placed in a flask of sterile distilled water until used. Skin sites, either for scar resection or for grafts, should be cleansed mechanically with soap and water, dehydrated with benzine and alcohol, and then painted with half strength of U.S.P. tincture of iodine.

The most difficult part of plastic surgery is that done before the patient reaches the operating room. It is the careful planning necessary to obtain success. Photographs should be taken and sketches made to show the original defect. Cellophane is very satisfactory for this latter work. It can be molded directly to the patient's face and the defect traced thereon with a red wax pencil. With the photographs and the sketches before one on a drawing board, all necessary scar tissue resections may be planned. The amount of soft tissue which has been lost is determined. It represents the amount of tissue which must be replaced, for it is a *sine qua non* that soft tissue when lost must be replaced by some method. On the other hand, if by the sketches,

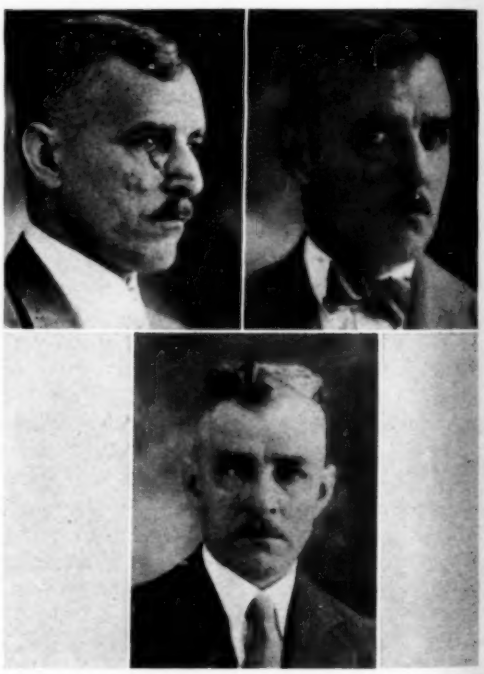

Fig. 1 (Spaeth). Pre-operative sketches above. Suture line in second photograph matches exactly the third sketch. End result after further massage in third photograph.

one can satisfy himself that there is no loss of soft tissue, that the defect is simply one of cicatrix and subsequent deformity, as the result of healing in malposition, it is an easy matter to return the tissues to their proper position by sutures after dissection. One can see this was the case in figure 1. The sketch made at that time, when compared with the suture line of the completed operation ilustrated this very nicely. An ectropion, however, as is shown in figure 2, shows without the

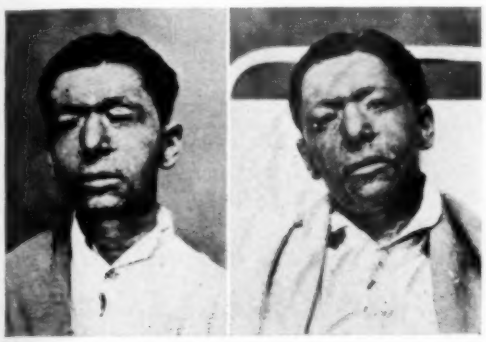

Fig. 2 (Spaeth). Cicatricial ectropion corrected by Gillies' inlays. Notice the pale color of the upper lid grafts left photograph.

slightest doubt that there must be soft tissue replacement. The same reasoning would apply to the bony defect of figure 3. One can be certain here that a cartilage graft is necessary.

On these same sketches, if a flap is

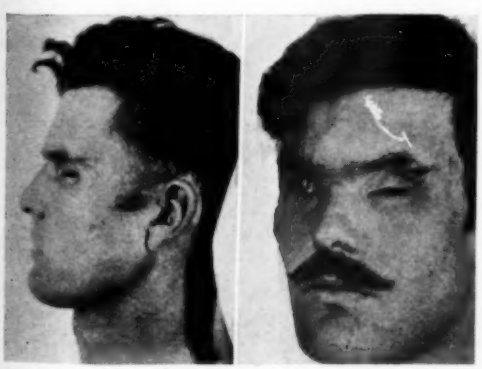

Fig. 3 (Spaeth). The photograph on left shows the very evident loss of outer bony angle of the orbit. Photograph on right shows the case after a cartilage graft correction of this angle.

to be used at operation, the lines and the position of the desired flaps may be outlined, the position of the closing sutures carefully considered, and the amount of undermining necessary determined. These sketches should be taken into the operating room with the patient. One need not be an artist for this part of the work. An artistic sense naturally is desirable but almost any person can illustrate his own cases in this step of the work.

In this paper we shall consider living tissue grafts as well as formalized cartilage. The latter has a definite rôle in plastic surgery. Relative to the use of paraffin, Hunt states, "against such an outrage for example, as the injection of paraffin into the human face with its attendant serious complications, no voice seems to be raised in even mild disapproval." The author cannot condemn it too severely. As living tissues we shall consider free skin grafts, mucous membrane grafts, fascia, cartilage and bone grafts. By a free skin graft is meant any graft not attached to the neighboring structures. A pedicle flap is one attached in some way, either by a skin pedicle or through a blood vessel and fascia pedicle.

Free skin grafts can be conveniently divided into two general classes, the epidermal, and the true skin or dermo-epidermal graft. The former includes the superficial epithelial cells with, in part, the median epithelial cells. The dermo-epidermal graft, however, includes the Malpighian epithelium with the subdermal connective tissue, skin capillaries and the nerve endings of the peripheral nerves. The pedicle flap is simply a convenient method of transferring a full thickness or dermo-epidermal graft from some contiguous region, used as such because of its much greater viability.

Cartilage (non-formalized), when used, should be resected from either the lobe of the ear or from the seventh and eighth ribs at the sternal junction of these ribs and usually from the right chest. It is wise, before a rib resection is done, to be certain that a careful chest examination has been made to prevent the development of complications from

an old undiagnosed chronic adherent pleuritis. This happened to the author and naturally the rib resection resulted in a perforation of the pleural cavity. In this instance no disturbing sequelæ occurred, but this accident is rather unpleasant and unnecessary.

The rib is outlined through blunt dissection, the anterior, superior and posterior surfaces all being well freed. The graft then can be outlined with a small scalpel allowing a narrow bridge to remain on the inferior edge of the rib, in this manner preserving the intercostal nerves and blood vessels. Healing is hastened by this strip of intact perichondrium. The outlined rib section is then cut free with a costotome and the cartilage trimmed to the shape and size needed. All available perichondrium must be conserved. This can be easily done if care is taken.

Bone grafts, when used, should be obtained either from the anterior superior spine of the ilium, with the periosteum intact, or as scales of bone still adherent to the periosteum, from the anterolateral aspect of the tibia. In the former a small saw and chisel are necessary, and in the latter a broad chisel and a mallet.

An epidermal graft, in its process of "taking" is undoubtedly kept alive by the early formation of capillary loops from its bed into which it has been forced and held by the pressure of the dressing. Fibrin may also play a part in this process of healing. Blood serum, however, if it collects or stands beneath the graft is perhaps the cause for most of the failures when using free skin grafts. A dermo-epidermal graft, when placed into position receives the necessary nourishment from the edges of its reception bed as well as from the tissues in contact with the under surface of the graft. In these cases there is some slight round cell infiltration and some fibrin is present. A large increase in capillary loops occurs. These penetrate the derm of the graft, and superficial desquamation develops in the uppermost cells of the graft. Here, as well, failures will result if hemorrhages occur beneath the graft. Another most important point is to prevent the formation of any unfilled spaces beneath the graft or the flap. Such spaces are more likely to occur with dermo-epidermal grafts. This applies equally to the use of cartilage and of bone.

The author has never had any success with either an epidermal or dermo-epidermal isograft. They have, perhaps, tissue reactions rather similar to those reactions which make imperative detailed typing and matching of donor and recipient in blood transfusions. Many other authors condemn them as quite valueless, though Elschnig reported a successful take in the case of a sister to sister. Formalized cartilage remains when embedded though perhaps only as a foreign body. Magitot has shown that after some time this becomes infiltrated with penetrating bands of scar tissue but that in spite of some very slight but inevitable loss the major portion of the graft remains. Isografts of cartilage (the author has had no experience with isografts of bone), have been repeatedly successful. It is quite likely that the statement relative to formalized cartilage also applies to human cartilage isografts.

Neither grafts nor flaps should ever be pinched. A free skin graft should be removed from the surface of the cutting razor blade and placed directly on the site prepared for it, or wrapped about the necessary mold without delay. It is not wise to immerse the graft in warm saline unless unavoidable delay in its use should arise. A dermo-epidermal graft or a flap can be lifted about by one or more sutures placed through its edge even before it has been freed from its original position. These sutures may be used for traction to assist in cutting the graft. Cartilage and bone grafts may be wrapped in warm saline-soaked gauze sponges for any necessary handling or because of delay in placing them. Warm vaseline applied lightly to the skin surface as well as to the side of the warmed razor blade assists in cutting epidermal grafts. Two small sharp hooks, attached by a short, stout four-inch chain, are quite satisfactory for holding the skin taut while the graft is being cut. Two pairs of such hooks are necessary, the operator holds

one pair while the other pair is held by the assistant. Grafts should be cut, if possible, without perforations. This is especially important in socket repairs. When such perforations, however, occur, the hole may be capped by an overlying additional strip of epidermal graft. An epidermal graft has an immediate contraction of one-half its plane surface, a dermo-epidermal graft slightly less than this.

There are only two basic methods for the utilization of free skin grafts whether dermo-epidermal or epidermal. They are either placed flat into the defect after the dissection is prepared for them, or they are wrapped about a mold and buried into the defect. With dermo-epidermal grafts, the former is by far the more common. Sutures are usually necessary with this latter type of graft. Epithelium must not be grafted upon the bulbar conjunctiva. The natural desquamations which form may cause a chronic mechanical conjunctivitis. Naturally, this does not apply if the eye is lost as an organ of vision. Under such conditions, an epidermal graft wrapped over a metal conformer is an ideal method for correcting symblepharon. The prosthesis can be worn applied in close contact to the blind eyeball. The inferior cul-de-sac, however, can tolerate fairly well epidermal grafts for a cicatricial entropion or for symblepharon.

The first essential is the resection of all scar tissue, both buried masses and bands, as well as the very evident superficial portions. Assuming the correction of a case of ectropion with a dermo-epidermal graft; the dissection for its reception is completed, the graft is lifted from its orginal bed, transferred to its new site and then sutured directly into position. The best example of this is the use of a free skin graft from the opposite lid. Figure 4 illustrated this type of graft. This method applies very nicely to the correction of a soft tissue loss and ectropion without much cicatrix, in the repair of cicatricial incisuræ or because of a notching of the lid margin. A deformity near the outer canthal angle responds well to this same procedure.

Fig. 4 (Spaeth). To illustrate full thickness graft for partial ectropion, from above the eyebrow (or from opposite lid), with hair line from the eyebrow.

The correction of a cicatricial ectropion with an epidermic graft is best illustrated by Wheeler's method, especially in a case where the lid margin may be actually drawn to the level of the eyebrow. In this the scar is resected by incision and by blunt dissection, along the natural lines of cleavage, the lid margins sutured together to form permanent intermarginal adhesions, and the graft laid in one piece over the defects formed by the dissection. Two small areas on each of the lid margins lying exactly opposite each other, immediately posterior to the line of lashes, and each at the junction of the middle and inner and middle and outer thirds of the lid margins are notched and denuded for a distance of 3 mm. and a depth of 1 mm. Sutures of silk are mattressed through these op-

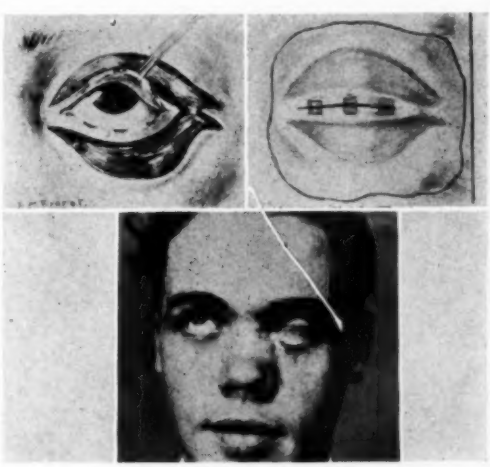

Fig. 5 (Spaeth). Wheeler's method of correcting ectropion. End result, with intramarginal adhesions intact. This is approximately three months old at the time of photography.

posing notches and tied over tiny rubber plates. Healing will result in the firm adhesion of the two lids. Figure 5 shows the correction of such an ectropion. These intermarginal adhesions are left in position from three months to a year while massage is applied to the reconstructed lids to prevent further cicatricial contraction.

The correction of an ectropion of one lid alone, that is where both upper and lower are not involved, is best carried out by Gillies inlay method, a procedure which he outlined during the war, and which still stands as a most satisfactory method of treatment. In this the scar is first resected. A mold of dental stent is then made of such a size that it will fill the defect and still allow the edges of the defect to be coapted and closed by a line of sutures. Figure 6 illustrates this. The epidermal

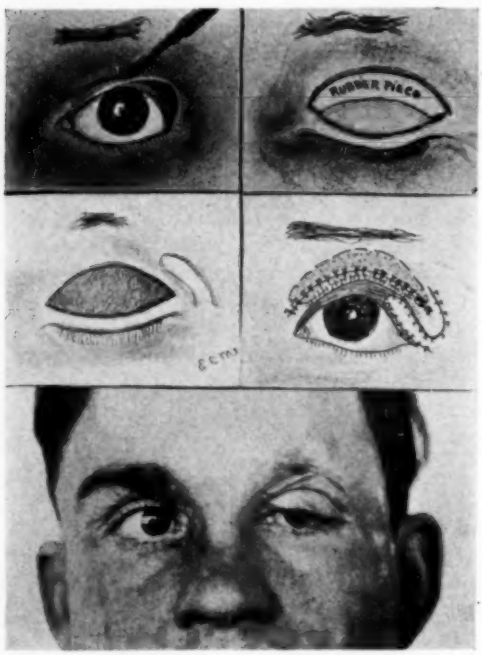

Fig. 6 (Spaeth). Gillies' method of epithelial inlay over a buried mold of dental stent. Photograph shows reconstructed lid at the time of its first dressing.

graft is wrapped about this mold, epithelial surface innermost and the mold with the graft upon it sutured into position. At the time of the first dressing, this line of sutures is taken out, the graft as it lies upon the mold is incised, the mold is removed and the epithelialized pocket opened outwards to supply the correction desired.

This same method is ideal for the correction of a contracted socket. In such cases any soft tissue replacement necessary for the lid margins or of the lid epithelium itself should be done first. Because of the more or less marked conjunctival deficiency present, it may be necessary to use pedicle flaps in these instances. When the case is ready for the socket correction, the line of the palpebral fissure on the lid margin is incised posterior to the lashes and all cicatrix within the socket resected. The incision line should pass behind the lower lid to the level of the bony orbit. After incising this, the dissection is to be carried upward and backward but well away from the upper rim of the bony orbit to save the orbicularis and the intact fibers of the levator palpebræ superioris. The socket is fitted with a mold of dental stent, the graft wrapped about it, mold and graft placed into position and the lid margins sutured together with temporary sutures. This mold must fit snugly, but without undue tension to the lids, into the entire bed prepared for it.

The above conditions illustrate the majority of the important indications for the use of both types of free skin grafts. As a recapitulation, they are to be used only in those cases wherein there is a definite loss of soft tissue, and the rather definite probability of removing all scar tissue deposited in the defect. This includes a large portion of the cases which appear for correction, but it does not include many more serious and more difficult cases. Those with extensive loss of soft tissue; those of long standing with a large amount of cicatricial contracture present, which cannot be wholly and cleanly freed of this; those cases without a firm base or a firm layer of normal tissue upon which the free skin grafts can be satisfactorily placed; and those cases wherein the tissues contiguous to the defect are themselves contaminated with contracting cicatrices. This last type of

case, incidentally, is the one positive indication for the use of delayed pedicle flaps, as skin flaps from the neck and chest by means of long cervical pedicles. These may be transferred and shifted two or three times in moving them from the original site to the correcting position.

Cutting a flap forms, of necessity, new and additional scar lines. This is a factor one must consider when the patient is a young female. The edges should be cleanly cut up and down though beveled, the flaps turned upon themselves and then freed of any subepithelial fat which is adherent. A suture placed in the apex and used as a tractor is adequate for moving the flap about without damaging it with forceps. It is necessary to allow for a slight contraction in the size of the usual pedicle flap though less than one-third to one-half of the plane surface allowed for free skin grafts. As many sutures as are necessary may be used, but they should be placed with very small bites and the finest possible suture material and needles used. A flap placed into position under tension is foredoomed to failure. It should lie taut but never stretched. Anchorage sutures, when necessary, are to be buried and double 0 or even triple 0 plain catgut should be used.

The flaps should be cut so their long axes parallel the normal tension lines of the skin as they lie about the orbit, the lids, and over the malar and zygomatic processes. These tension lines follow absolutely the direction of the muscle action of all the muscles and the ligaments which lie under the skin in this region. Those we must consider are the ascending forehead fibers of the frontalis, the circular fibers of the orbicularis oculi, the pull of the two canthal ligaments and the horizontal raphe-like action of the fibers of the orbicularis especially at the inner canthus, the pyramidalis nasi and its oblique fibers lying over the bridge of the nose, the horizontal fibers of the compressor nasi lower down, the caput angulare, the caput infraorbitale, and the caput zygomaticus of the quadratus labialis superiorus, the caninus, the zygomaticus major and especially the oblique descending pull of the large masseter and temporal muscles. Even the anterior auricular muscle is a factor in this matter of tension lines. Unnatural, strange, and new expressions can be obviated if care is taken in locating the direction of the different flaps. Figure 7 illustrates the direction of these tension lines.

Fig. 7 (Spaeth). Sketch to illustrate tension lines. The frontalis M. above; the orbicularis M. about the lids, the oblique and vertical muscles below the lid. (See text).

Figure 8 illustrates that type of case wherein it was simply necessary to resect the scar and to resuture, moving the two flaps upward by the sutures into a correcting position. The suture line follows these tension lines. Finger-like pedicle flaps from above the eyebrow, using the skin of the forehead or the hair free skin over the temples, are usually quite satisfactory for the correction of many cases of cicatricial contracture, and especially for contraction ectropion of the lower lid where there has been a loss of considerable soft tissue. These same flaps may be raised with a pedicle attachment at each extremity, when it is necessary that they be of a considerable linear or lengthwise

Fig. 8 (Spaeth). Simple scar resection and resuture with full correction. Photograph on right is five days after the operation at the time sutures are to be removed. Full correction obtained. Notice the curve of the suture line, as well as the very satisfactory level of the margin of the lower lid.

size. The central portion of such a hammock flap is moved downward into its correcting position. After healing has occurred, these two pedicles may be returned or resected and discarded. Such flaps have, undoubtedly, a greater margin of viability but their use is rather limited. Figure 9 illustrates a case wherein it was necessary to bring the flap down from above the forehead to obtain the necessary correction. Formalized cartilage had to be used for a correction of the orbital bony defect. Figure 10 is a case illustrating the complete loss of the upper and lower lid following complications which occurred with the reconstruction of a contracted orbit. Socket repair was satis-

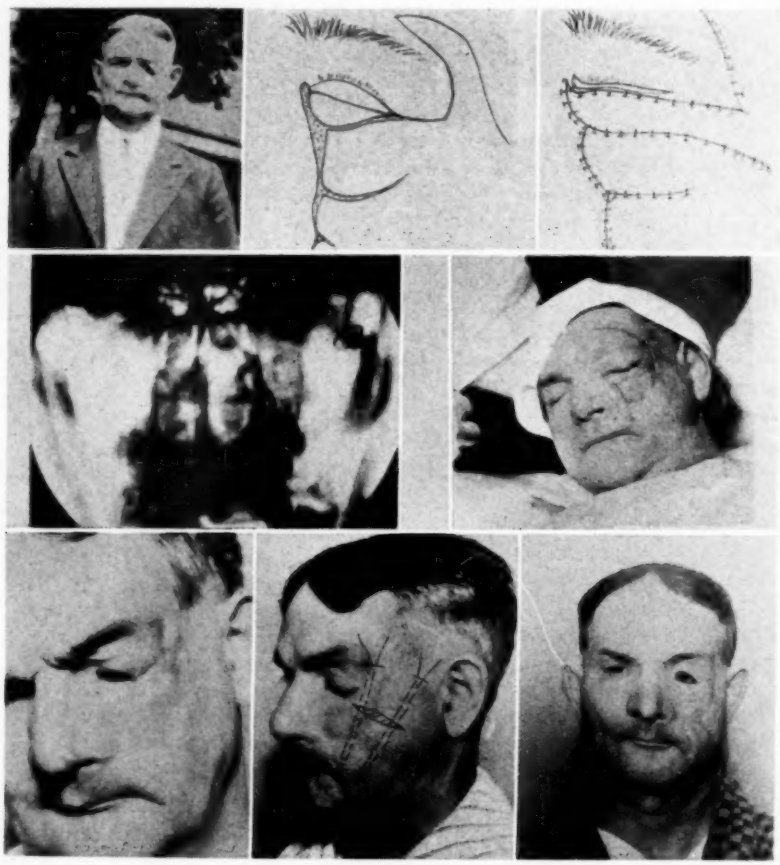

Fig. 9 (Spaeth). Complex case. Sketches show flaps from temporal region. Photograph on right in second group shows suture line at the time of the flap correction. X-ray film shows silver wire sutures for the formalized cartilage graft. Three lower photographs show the end results on right, position of the buried while silk face suture, and on the left the case before the sutures were inserted.

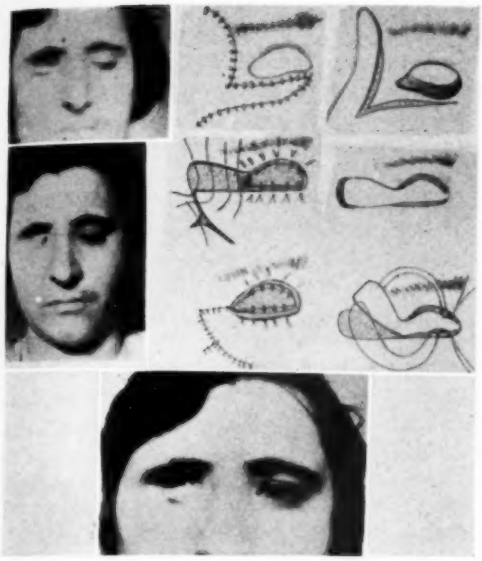

Fig. 10 (Spaeth). See text for the details of this case. Upper photograph shows socket after correction, lid still absent, second photograph shows palpebral fissure completely closed by curtain of soft tissue (except for small drainage opening at inner canthus), lower photograph shows completed case. Patient is wearing a silver conformer awaiting her ocular prosthesis.

factory, though a pressure lid sloughing occurred. A pedicle flap was brought down from the temporal region to fill in necessary tissue at the site of the lower lid. The margins of those lid remnants remaining were then opened and a second flap turned in upon itself, rather like a hinged door. This was sutured to the posterior lip of the freed lid edges of the upper and lower lids. The anterior surface was covered with a free skin graft. The case was completed by opening this curtain of soft tissue in line with the palpebral fissure. The patient is awaiting, at this writing, a hair-line graft on the upper lid from the opposite side to replace the lashes. She is wearing a glass conformer in lieu of a glass eye in the photograph.

Drooping of the outer canthal angle is easily corrected by a small finger-like flap. The author's modification of the classical Fuchs' tarsorrhaphy works well in the slighter degrees of this. Trichiasis is corrected by a Z-shaped incision and the transposition of the two flaps thus outlined. Epicanthus is overcome by a similar method, thus actually elongating the line of the palpebral fissure. Two flaps are outlined from the outer surface of the epicanthal fold, one placed into the lower lid, the other into the upper lid. Blair does this most successfully. Similarly, large flaps may be brought down from above the eyebrow with a tubed pedicle, turned upon themselves, their anterior surface covered with a second sliding flap and in this manner an entire lower lid formed or repaired. Figure 11 illustrates

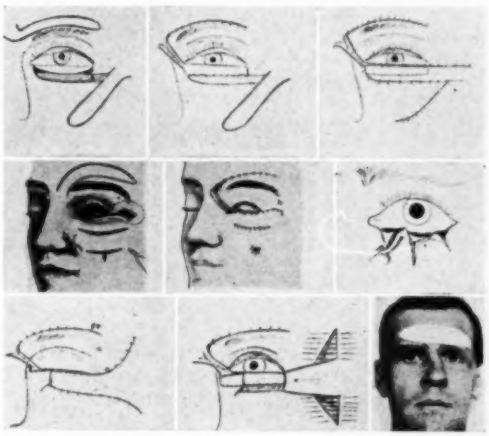

Fig. 11 (Spaeth). A group of cases to show tubed pedicles from above the eyebrow combined with flaps from below the orbit for the reconstruction of a lower lid.

this by flaps moved into position either from below, or from the side. These flaps may have within them earlier inlays of skin or of cartilage for additional cosmetic value toward forming the posterior surface of a lid or for holding the shape of the reformed lid by the cartilage.

Figure 12 represents a procedure outlined by Morax which combines very nicely pedicle flaps with free skin grafts for the repair of a contracted socket, especially that type of contraction and deformity found after evisceration. The lids are reopened, turned upon themselves, their posterior surface grafted and after this "take," they are replaced to their original position over a temporary mold, this to be replaced later by the prosthesis. This same principle

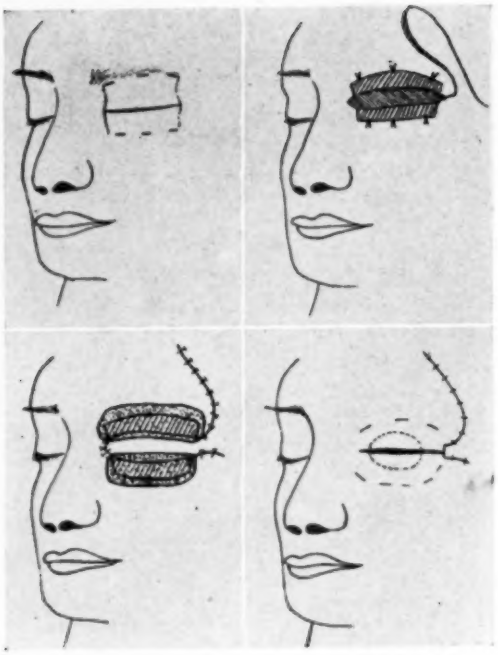

Fig. 12 (Spaeth). Method recommended by Morax for correction of complete symblepharon. A complex and rather formidable looking procedure but with good end results.

was used in the correction of the case illustrated in figure 10.

Figure 13 shows a canthal deformity remaining after the repair of the socket. It was corrected by means of reflecting upon itself a small flap of the epithelial surface. The raw surface of the defect and of the reflected flap was covered by a small pedicle flap cut near the outer extremity of the eyebrow. The correction obtained is well seen. The patient is wearing his permanent prosthesis. In this individual, even though the contracted socket followed exenteration for malignancy, a Thiersch graft was used for the correction. Usually, however, the procedure just discussed, by Morax, or a modification of it is more successful and certainly less difficult. The pure epidermal graft does not take well when applied to the non-elastic, scar tissue covered, bone and periosteum which results from orbital exenterations.

Wheeler has a most ingenious method for correcting lid colobomata in the central portion of the lid margin (halving operation), a procedure wherein the conjunctival surface and the skin surface of the lids are separated, the tarsal cartilage is found, and its margins separately approximated. The conjunctiva is first closed with very fine sutures. Catgut must be used here because they are buried. A small rectangular skin flap is dissected free from the edge of the coloboma opposite to the line of tarsal sutures, so that as it is lifted and moved laterally it will fit into a bed prepared for it upon the opposite lip. The two lines of sutures, conjunctival and epidermal, are thus offset, one from the other. These sutures should be tied over tiny rubber plates. An external canthotomy is occasionally necessary when using this principle.

Figure 14 shows the use of a pedicle flap from the cervical region according to the procedure of Snydacker as modi-

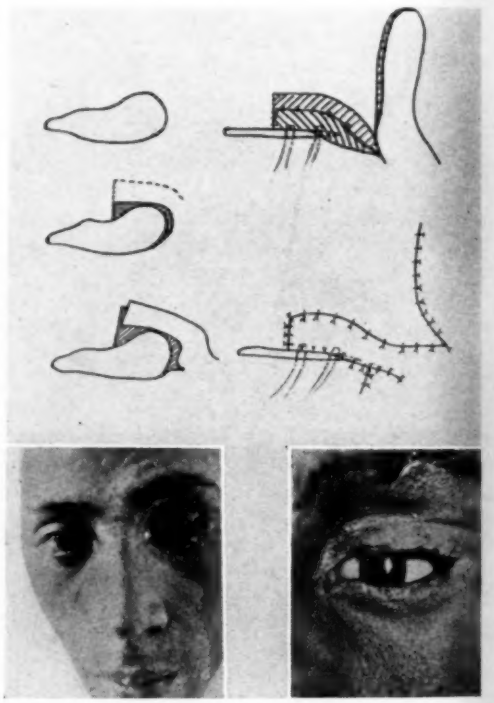

Fig. 13 (Spaeth). See text for details. Photograph on left shows the canthal deformity, while that on the right shows the corrected angle with a prosthesis in the socket.

fied by Morax. In this the pedicle was first lifted and tubed. Ten days later the flap was lifted and sutured into position, and ten days after that the pedicle resected and returned. Ten days later it was necessary to elevate the outer horn of the flap to give it additional lift. The case was one of a healed traumatic osteomyelitis wherein the orbital floor had first been repaired by a cartilage graft.

Eyebrows may be replaced by one of several methods, a pedicle flap or a free skin graft from the opposite eyebrow, a pedicle flap over the hair line at the temple or best of all by a graft from the scalp. These occipital scalp grafts are rather thick and while being trimmed, before they are placed into a correcting position, it is most important to conserve and not injure the hair follicles as they appear upon the reverse surface of the graft. These grafts should have their edges cut obliquely so the posterior surface has the greater plane surface. The lower end of the graft must lie most temporalward. Transplantation of the line of lashes, in trichiasis in part or wholly, is far better than is either ablation or depilation. Eyelashes can be replaced by free skin grafts from the lower edge of the eyebrow. Figure 15 shows well the formation of new eyebrows.

Fig. 15 (Spaeth). Eyebrows (on right) ten days after the insertion of scalp grafts.

Mucous membrane grafts may be mentioned here as they apply to the repair of entropion and of symblepharon. The natural moist habitat of mucous membrane allows its transplantation upon either bulbar or palpebral conjunctiva. Such grafts must be trimmed very thin, however, and applied snugly with sutures. Mucous membrane does not adjust itself well to correction when wrapped over a mold or upon a conformer. Fascia may be used to fill in superficial defects, with success, but fat is of no permanent value for this.

Imre has developed a beautiful technique of sliding flaps. It is quite applicable to all types of defects, but especially satisfactory in neoplasms. In restorations, after the resection of epitheliomata, the flap is outlined as in the drawing, the undermining indicated and a small Burrows' triangle planned so that its resection closure will move the flap up and toward the defect. This method has been utilized in many different ways. The illustration in figure 16 shows a basic principle. Imre has used it to cover fistulæ wherein a second buried flap of fascia had been moved to form the necessary base for the more superficial dermo-epidermal graft or flap. It is the most satisfactory

Fig. 14 (Spaeth). See text for the four stages in this operation (Snydacker's plastic) as outlined by these four photographs.

Fig. 16 (Spaeth). Imre's principle of sliding grafts (From Imre's text).

method for moving contiguous skin, often in large amounts, into a correcting position to overcome soft tissue loss.

Cartilage: When cartilage or bone is necessary for the correction of a defect in the bony tissues, clean dissection is the first essential. It is important that a layer of fascia should overlie this graft. This is necessary so the line of skin sutures or pedicle flap sutures will not lie immediately above the graft. Failure from secondary infection is quite likely if this cannot be arranged or is disregarded.

Figure 3 illustrated the repair of the outer bony angle of the orbit by means of a "V" shaped cartilage graft. Figure 17 is of another case showing the correction of the floor of the orbit by cartilage wedges, inserted under the periosteum of the bone fragments still present.

Dressings: The postoperative care in these cases is most important. Free skin grafts should be dressed with sufficient pressure to hold them firmly in place without any later crawling or wrinkling of the grafts. The inlay grafts may be covered with overlapping oblique strips of oiled silk, laid down rather like shingles on a roof, with a sea sponge applied directly above the oiled silk. The bandage furnishes the necessary pressure for the grafts through this sea sponge. Both eyes are covered and the patient kept in bed until the first dressing is done at the end of ten days.

Free skin grafts, both dermo-epidermal as well as epidermal (as in Wheeler's method), can be covered in this same manner, or even better, with a thin wafer of dental wax (not dental stent), molded over the defect before the graft has been placed, or even cut—this to form the base for the overlying sea sponge. Flaps should have a moderate amount of pressure as well, using the strips of silk and the sea sponge, but they are to be dressed for the first time on the fourth day. At this time, one may start the removal of the sutures, each alternate one being taken out, also with every change of dressing at 48 hours interval.

Fig. 17 (Spaeth). See text for description. Cartilage repair of floor of orbit.

Permanent and serious corneal damage has occurred due, perhaps, to retained conjunctival secretions when intermarginal sutures have been used, or when it has been necessary to occlude an eye by a pressure bandage because of a free skin graft. Naturally, sutures must never be placed so they lie in contact with the cornea. Catgut, silkworm, and horsehair will certainly cause trouble. It seems that silk is best tolerated in the conjunctiva.

Such complications are usually ushered in by pain. The patient's complaint starts about 48 to 72 hours after the operation, will continue and it may be-

come worse. The presence of such a complaint when no other cause for it is evident makes it imperative that the dressing be removed, the operative site inspected and a second dressing applied. Unfortunately, when free skin epidermal grafts have been used, this will probably result in a failure in the operative result—but at least it will not be followed by corneal damage and the anxiety and cost of an expensive malpractice suit. The occurrence of corneal ulceration is fortunately rare.

The pressure which is applied to a dressing for the free skin graft repair of a socket must be well gauged, also, because sloughing of the lids has occurred in such instances. Here also, the complaint of pain is the only warning that things are not satisfactory. In only one instance, in the author's experience, was this matter of pain disregarded. In this case the slough had occurred and was found at the time of the first dressing.

Infection in a graft or a flap is usually accompanied by pain and by a rise in temperature—also the patient may become rather ill. In many graft cases the dressing develops a foul odor, especially in warm weather, even without the presence of infection. This odor is rather different from that due to infection. The former is one of retained secretions, the later that of suppuration. They can be distinguished, one from the other. In the absence of other symptoms and signs, this odor need not cause great concern though it does mean that the dressing should be changed at the earliest time possible, consistent with proper postoperative procedure.

Cartilage repairs and bone grafts should be dressed with pressure and with a plaster of Paris bandage, the dressing to be changed on the tenth day. A bluish discoloration of a graft, especially when in the central portion of a flap or in a dermo-epidermal graft is indicative of its low vitality, even death. If this occurs that portion of the graft will undergo liquefaction followed by secondary contraction. At times, a few shallow stab wounds in this portion of a graft may reëstablish its vitality but this discoloration is always a serious sign. Cartilage and bone grafts should be dry and remain dry to insure successful takes. Gaping of the wound, or even the appearance of serum from the wound is unsatisfactory. Infection, naturally, manifests itself by a spontaneous opening of the wound and subsequent suppuration. It is especially important that these cases be free from hemorrhage, even capillary oozing, before they are closed.

There are three other procedures applicable to the detail of this paper. The first is the use which can be made of pressure atrophy. Its principle is known to all of us because of those unfortunate cases of decubitus seen repeatedly. An appliance has been made to fit over the upper lid, to mold by pressure a contracted socket and at the same time, by a second superimposed plate, to thin out a thick unwieldy reconstructed upper lid. This was worn for a period of four months. Figure 18 illustrates an appliance used and a socket formed with this, no graft having been used. The

Fig. 18 (Spaeth). Socket reconstructed by pressure atrophy. Lower left corner shows pressure appliance as it was for mounting upon the upper teeth. Upper right photograph shows appliance in position, and lower right shows the reconstructed socket.

steady pressure, as applied, was sufficient to cause the complete absorption of the massive cicatrix within the socket.

The second principle is that of mechanical support. Figure 19 shows a bilateral ptosis with a complete external

Fig. 19 (Spaeth). Crutch glass correction of ptosis. These had been worn three years when photographed.

ophthalmoplegia, operation being out of the question for it would most certainly endanger the cornea through exposure. The cosmetic result is quite satisfactory through the use of crutch spectacles. These elevating loops are attached to the upper rim of the spectacles, of such a size and height that the lid is elevated without uncomfortable pressure.

Buried white silk sutures have been repeatedly used for the correction of ptosis, for lagophthalmos, and in old facial paralysis with obliquity of the palpebral fissure. Figure 9 illustrates that lagophthalmos, when paralytic, responds well to these sutures. A high degree of exophthalmos with impending prolapse of the eyeball anterior to the lid margins has been held most satisfactorily in position. Cicatricial lagophthalmos responds well to this treatment. In the looped suture of Axenfeld, the upper end of a white silk suture is passed along through the upper lid parallel to the margin, the lower end in the same manner through the lower lid. At the outer canthus the ends cross and are themselves buried after being tied with sufficient tension to obtain all

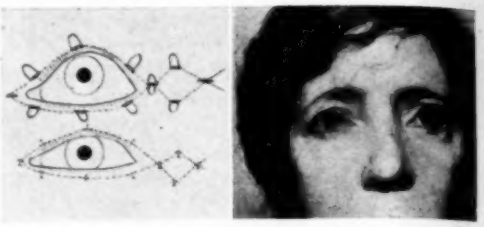

Fig. 20 (Spaeth). The photograph illustrates a high degree of unilateral toxic exophthalmos corrected by sutures. Upper sketch shows suture in position for tying (see text) while the lower of the two sketches shows the suture wholly buried and in a healed permanent position. The case was admitted with an anterior displacement of the eyeball anterior to the upper and lower lids.

necessary correction. Figure 20 illustrates the suture.

The third example is illustrated in figure 21 and is the type of prosthesis recommended for an inoperable defect. The prosthesis is made from a mold conforming to the natural side of the

Fig. 21 (Spaeth). Prosthesis for inoperable defect. See text for details.

face, cast in aluminum, and painted most carefully by an artist to match exactly the patient's natural coloring. This one illustrated is complete save for the painting. The artficial eye has been mounted in prongs similar to those used for jewels, the lashes have been built up with fine copper wire, and the entire appliance mounted into recesses on the temple and the bridge of a heavy horn composition spectacle frame.

The author appreciates that much herein has been presented before in various texts and monographs, also that much important detail has not been in-

cluded. It is, however, a convenient abstract of some of the forces which underlie ophthalmic plastic surgery. Textbooks on the subject must be utilized repeatedly by all in order that we may become and remain proficient in this exacting part of ophthalmology.

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MONOCULAR CYCLOPLEGIA FOR THE CONTROL OF MYOPIA

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Based on the hypothesis that progression of myopia may result from tension of the extraocular muscles during prolonged convergence in near work, all such cases were treated by dissociating the eyes for near vision through monocular cycloplegia. Detailed report of one case thus treated over a period of eight years is given. The treatment was successful in checking progression in all cases during the time of its use. Read before the St. Louis Ophthalmic Society, January 23, 1931. From the Department of Ophthalmology, St. Louis University School of Medicine.

Two striking statements made by Donders[1] more than three score years ago have become veritable watchwords for modern ocular hygiene in the care of myopia. The first is that the cure of myopia remains merely a pious wish ("piis desideriis"); the other, that an eye with progressive myopia is not a healthy eye. The former emphasizes the necessity for prophylaxis, since myopia, if once established, is not curable. The latter statement obviously demands that the individual who is growing more nearsighted, at any age, shall have the benefit of competent care by an eye physician whose fundamental medical training is required to discover and treat properly any possible complicating diseases.

The use of monocular cycloplegia to dissociate the two eyes in near work for the control of myopia is based on Donders' observations concerning the tendency of convergence for prolonged and excessive near work to produce myopia and of the relative exemption of watchmakers. Donders pointed out that primarily watchmakers as a group were addicted to the use of a monocular magnifying loupe and thus by the use of one eye only, eliminated the pressure of the extraocular muscles regularly exerted in strong convergence of the visual axes when the two eyes are used in binocular fixation for near vision.

The provocative rôle of constant intensive convergence in binocular fixation upon near work, in causing progressive increase in myopia has received universal recognition, but practically no attempt appears to have been made to utilize monocular fixation for near vision for the purpose of checking it.

The tentative suggestion that the exercise of accommodation alone could produce changes within the eyeball resulting in actual myopia has been summarily dismissed by Donders and all careful students of this problem. Nearly half a century ago, H. Gradle[2] in reviewing the evidence that the constant use of full correction of myopia by concave lenses tended to arrest its progress in spite of the fact that it necessarily demanded greater activity of ocular accommodation in near vision added this apt explanation. "There is more reason to regard the convergence of the eyeballs during close work as one of the conditions conducive to myopia. If the myopia be not corrected, there exists, indeed, a vicious circle. For the nearer the far point moves toward the eye, the greater must be the convergence necessary for the maintenance of binocular vision. Whenever the internal recti muscles rotate the eyes inwardly, the external recti muscles are put on the stretch, and being wound up on the eyeball by the forward movement of their scleral insertion, they must exert a pressure upon the eye. With the greater length and ovoid shape of the myopic eye, this

compression necessarily increases, because the posterior pole of the myopic eye, being farther distant from the center of rotation than in emmetropia, subjects the external rectus to greater traction while rotating. The compression of the eyeball thus produced and maintained cannot but augment the distention of the sclera." Von Graefe[3] believed that this effect was to be attributed to both internal and external recti muscles, while according to Stilling[4] the superior oblique also had a part in producing compression in close work.

Critical clinical observations for the past eight years have shown consistently excellent effects from dissociation of the two eyes in near vision through monocular cycloplegia. The actual attainment of control in myopic persons who had shown both previous and subsequent tendencies to increase of their nearsightedness affords proof for Edward Jackson's[5] statement that "excessive convergence in the great majority of cases starts the myopia and keeps it progressive"; and seems to show that Donders' explanation about the exemption of watchmakers which suggested this clinical experiment is entirely correct.

Obviously to produce dissociation of the eyes in near vision it is not necessary to place a magnifying loupe over one eye. The same result may be much more effectively attained by the daily or even semi-weekly instillation of a one percent solution of atropine in one eye only. Thus are combined the possible beneficial effects of dissociation in near vision with the rest to be obtained by cycloplegia.

The instillation of atropine in myopic eyes to secure periods of complete rest from near vision is a well established practice. It was recommended by Donders and, among recent authors, Parsons[6] states, "If the eyes are irritable or the myopia is progressing, complete rest is imperative. Atropine should be instilled once a day for a prolonged period in addition to tonic measures." This advice contemplates the use of the cycloplegic in each eye to secure complete rest. Its disadvantage lies in the annoying glare and the suspension of near work which has economic drawbacks for both workers and students. It is even conceivable that a myopic individual with far point of a foot or less (M 3. D+) in spite of a complete cycloplegia of both eyes, might achieve binocular near vision by removing his distance correction, thus becoming liable to all potential harmful effects of convergence.

Under monocular cycloplegia, the glare is less and attempts to read or do close work without wearing proper correction afford the myopic individual no satisfaction. He is obliged in near vision to use only one eye at a time with or without glasses and usually resumes his regular distance correction as most desirable for all purposes. If progressive myopia can be checked by monocular cycloplegia as seems possible from recent experience, it may enable the young student to carry on without the serious loss of time demanded by the conventional binocular use of cycloplegia.

For the absolute evaluation of the efficiency of any method proposed to check or control progressive myopia, it should be possible to select the cases that are progressive. Jackson[5] states that "all cases of myopia are 'progressive' at the start and cease to be so when the conditions that produce myopia are removed". Parsons[6] notes that "it is impossible clinically or pathologically to draw a distinct line of demarkation between the two forms" simple or progressive myopia. An appropriate corollary to these statements is found in de Schweinitz'[7] quotation from Priestley Smith, that it is necessary "to suspect every myope and especially every youthful myope of a tendency to increase until time has proved it to be stationary, to be doubly suspicious in the presence of congestion or atrophy of the eyeground and to reexamine at intervals of six months, twelve months, or longer according to the nature of the case".

This study of monocular cycloplegia for the control of myopia has been limited to near-sighted patients with apparently progressive myopia seen in

private practice where arrangements for a close follow up could be made. It was used more than one hundred times though the total number of patients is about one third that number as in some cases the treatment was applied repeatedly at various intervals. This series lacks the type of cases in which myopia is associated with marked impairment of general nutrition due to poverty, which may appear in free clinics, but there were enough cases of defective nutrition even in this selected group to indicate a greater susceptibility to progressive myopia among such children.

A review of each clinical record would be unnecessarily tedious. So far in every case the use of monocular cycloplegia has checked the advance of myopia during the period in which it was being used. Maximum visual acuity without increased correction was maintained in every case while monocular cycloplegia was being used. A temporary increase (0.5 D. sph.) was recorded in one instance but was followed by an equal recession.

In a few cases, including divinity students at St. Louis University as well as younger students in grade or high schools, an apparent recession of the myopia of 0.25 or 0.50 diopters was noted where the monocular cycloplegia was continued without interruption for several weeks. This suggests the possibility that there may be a minimal recovery incident to a slight inherent elasticity in stretched sclera, after the pressure of the extraocular muscles produced by prolonged binocular near vision has been eliminated for a considerable period. This slight recession remained for weeks or months after monocular cycloplegia was discontinued and thus differs essentially from the "notable" reduction obtained by Purkinje[8] in his own myopia *for several hours* only by having bags filled with shot tied on his eyes over night.

A report by V. Hasner showing a recession in the myopia of a patient prohibited by long illness ("typhus") from the use of eyes for near vision is recorded by Donders[1] with frank avowal of his disbelief. Among the cases in this series the arrest of an apparent progressive myopia was noted in a young girl having hip joint disease, after several months of enforced rest in bed and abstinence from near work, but there was no actual recession.

Where monocular cycloplegia was continued for more than a few weeks, it was customary to change from one eye to the other, but the effect noted on the course of the myopia was binocular notwithstanding the fact that the instillation of atropine solution was monocular.

The clinical notes on the first case in which it was used will answer most of the questions regarding the practical application of monocular cycloplegia. The patient was a physician's daughter and could be examined frequently through her father's intelligent coöperation.

M. W. aged 9 years, when first examined at my office by Dr. F. O. Schwartz in 1918, showed a simple myopia corrected fully by —0.50 D. sph., with vision 20/15 for each eye. When she returned for reëxamination five years later (March 31, 1923), vision equaled only 16/120+ each eye, attained only by partially closing eyelids (squinting).

Measurement of refraction without mydriatic indicated myopia of 5. D. Vision was 16/15 with this. When tested under atropine each eye revealed a myopia of 4.50 D. correction of which permitted vision of 16/15, right and left. Measurements of refraction were found later to be the same with and without mydriatic. She was at this time a pupil in high school, carrying a fairly heavy course of study. Glasses were ordered —4.50 Sph. R. E. and L. E. and the usual instructions concerning ocular hygiene in myopia were given.

One week later, after glasses were secured, vision with them was only 16/19 but was raised to 16/15 with —0.50 D. sph. addition. (equals —5.0 D. sph.) for each eye. After another week the same state of vision and refraction was found and after a third week vision with her glasses fell off to 16/24. It was at this date (April 26, 1923), that monocular cycloplegia by the in-

stillation of atropin 1 percent solution was begun.

Four days later, without change of the original correction, vision had returned to 16/15 each eye. Moreover she reported that she was able to pursue her studies without discomfort. Instillations of atropine were continued in the right eye only at intervals of three or four days for a month, at which time vision remained 16/15 for each eye with her glasses unchanged. Instillations were then stopped.

Four days later her vision with her right eye still remained 16/15 but with the left eye it had dropped to 16/19. It may be noted that it was in the right eye only that the cycloplegic had been used. It was natural perhaps that the opposite eye should be the first to show a slight tendency to increased myopia and corresponding loss of vision. The instillations of atropin in the right eye were resumed and four days later vision was again 16/15 and equal with each eye. Two weeks later, June 14, her vision was improved to 16/12 without change in correction. As the summer vacation was at hand, she was urged to avoid all near work or study until the opening of school would demand its resumption in fall.

She returned for reëxamination on September 10, 1923, when conditions were found to be the same as at the close of school three months before; namely vision equaled 16/12 with either eye with her own glasses. One month later (October 15, 1923), vision still equaled 16/12 for each eye and was not improved by the addition of any minus lens to her own glasses. After two months of school work (November 15, 1923), her vision was 20/15 with her original correction but an improvement to 20/12 was noted on the addition of —0.25 D. sph. to each eye.

One month later (December 10, 1923), her vision had dropped to 20/24+ for each eye and the instillation of atropine which had been stopped in June, six months before, was resumed in the right eye. At the next examination, one week later, vision had again improved to 20/19 for each eye. Treatment and examinations were omitted during the Christmas holidays.

One month later (January 15, 1924), the condition remained unchanged and no cycloplegic was used. But by March 3, 1924, (nearly two months later) vision had dropped again to 20/24+ and the instillation of the cycloplegic in the right eye was resumed at intervals of one week, changing in April to similar instillations in the left eye instead of the right.

By May 1, after instillations had been kept up for two months, her vision had returned to 20/15 for each eye still with the original correction. Instillations were stopped on May 22, and on June 5, 1924, vision remained 20/15 for each eye with her own glasses.

Another summer's vacation without study was passed and on September 8, 1924, her vision was equal to 20/15, each eye, with the same glasses. One month later (October 9, 1924), it had receded to 20/19.

November 20, 1924, she reported that glasses had been broken and that she had studied three days without them. She was again wearing them but an addition of —0.50 D. sph. to each glass now gave a distinct improvement in vision to 20/15+. No change was made in her glasses but the monocular instillation of the cycloplegic was resumed at intervals of one week.

One month later vision was 20/19+ with either eye and 20/15+ with the two eyes together, without change in her glasses. The cycloplegic was then stopped and conditions remained unchanged during monthly inspections without any treatment until four months later (April 20, 1925), when vision had dropped to 20/19 for the right eye and 20/24 for the left eye.

The monocular instillations of the cycloplegic with a three day interval seemed to stop this relapse and May 11, three weeks later, her vision had returned to 20/15 for each eye with the original correction. She had thus reached the end of her course in high school (two years from time treatment

was begun) without any further increase in her myopia. Every suggested increase as above noted had been checked by monocular cycloplegia.

She entered Washington University where she seemed to have a respite from the tendency for increased myopia. On reëxamination two years later (June 28, 1927), having completed two years' work at Washington University with subjective comfort, her vision was 20/15 with each eye. A slight addition (—0.25 cyl. at an oblique axis) for each eye, improved vision to 20/15+. She was not seen again until three years later (March 27, 1930), having in the interval completed her studies at Washington University and obtained a position as librarian. She now showed definite increase in the myopia of each eye and an additional myopic astigmatism. Her vision with the original correction had fallen to 20/40 for each eye.

The correction ordered for her on April 10, 1930, was R. E. —5.25 D. sph. —0.50 cyl.ax. 30°. L. E. —5. D. sph. —0.75 cyl.ax. 150°. With this, vision was equal to 20/15+ for each eye. These glasses represent an increase during the last three years of 1.25 D. in the strength of the concave lenses over the original correction. After her graduation from high school, five years ago, she gave little attention to her eyes, having presented herself for examination only once, in June, 1927.

It seems reasonable to assume that the loss of vision and actual increase in myopia occurring during this last intermission of three years would certainly have happened earlier if each tendency to an increase had not been noted and checked during the last two and one-half years of her high school studies by frequent observations and the use of monocular cycloplegia.

Several reactions of especial interest were noted in a girl who was under observation at intervals for ten years beginning when she was five years old. In that period she had progressed from emmetropia to a myopia totaling more than seven diopters for each eye. Her first glasses (—2.5 D. sph. R. E. and L. E.) were prescribed in December, 1924. Six increases in her correction (the last in February, 1931), have become necessary to maintain the ideal of full correction as defined by Hess. In every instance the increase in the myopia occurred during intermissions between the use of monocular cycloplegia. One increase of 0.5 D. was noted during measles, another when a reckless school teacher demanded fifty pages daily of extra reading. During the ten years that this case was under observation there were eight separate periods of persistent monocular cycloplegia, when monocular instillations of 1 percent solution of atropine were made at intervals of two to five days. Three of these lasted for one month each, three were for two months each, one for three months and the last period continued for eight months. During each of the first four periods of monocular cycloplegia [1925-1926 and 1927 (twice)] a prompt recession of 0.5 D. in the myopia was noted. After the last of these (April, 1927), when the atropine had been stopped, epinephrine solution 1/10 percent t.i.d. instillations were substituted during the summer.

An increase of 1.5 diopters in the myopia was noted in the fall. Monocular cycloplegia was resumed in November, 1927. One week later epinephrine instillations were added, and after three weeks a recession of 0.5 D. was again attained. Early in 1928 and in January, 1931, the use of monocular cycloplegia seemed to check a manifest tendency to increase in myopia. From May, 1928, to November, 1930, the patient was seen at irregular intervals and received practically no treatment. Therefore an increased nearsightedness of more than two diopters during this period seems significant.

In March, 1931, another increase in the myopia was apparent and monocular cycloplegia was resumed. At first there was no arrest and a further increase of 0.5 D. was recorded. Monocular cycloplegia was continued without further increase until the end of the school year in June when a reces-

sion of 0.5 D. was noted. At the same time the patient was getting injections of theelin to correct an evident endocrine deficiency. The possible relationship of this factor to the recession in the myopia must however remain in doubt.

Monocular cycloplegia which had been maintained with 33 instillations from March to June (one instillation every three days) was continued less frequently (averaging one instillation weekly) for five months longer, until November, with apparently perfect arrest of her myopia at the degree for which her last correction was prescribed nine months before. Those glasses are R. E. —6.25 D. sph. —1.0 cyl. ax. 15°. L. E. —6.0 D. sph. —1.5 cyl. ax. 180°. All treatment was stopped November, 1931, and two months later, January, 1932, a new increase of 0.62 D. was recorded. Her visual acuity has remained unimpaired (20/15 for each eye) and there are no pathological changes in the ocular fundi.

Where extensive disease of retina, choroid, and vitreous humor exists in high myopia, bringing with them the threat of retinal detachment, effective stoppage of all intraocular muscular movement through binocular cycloplegia is indicated.

In one such case, a woman, aged 34 years, with approximately 17.0 and 20.0 diopters of myopia respectively, right and left, and best vision reduced to 20/200, right, and 2/100, left, with correction, a one percent solution of atropine was instilled weekly or oftener in each eye for seven months with marked improvement in vision to 20/100 for each eye with correction unchanged, and complete relief from the annoying "flickering" a possible subjective prodromal symptom of retinal detachment. Monocular cycloplegia was then substituted with increased comfort for the patient. It was continued for four months occasionally alternating instillations between right and left eyes. An interruption of two and one-half months followed, due to a temporary removal from the city.

Upon her return vision was 20/120 for each eye with the original correction and monocular cycloplegia was continued for six months longer. After this followed a period of nearly two years without any treatment, vision and refraction remaining unchanged. The binocular instillations of the cycloplegic were then resumed at intervals of one or two weeks as there was a slight return of subjective "flickering". Binocular treatment was continued with apparent benefit for six months until the patient removed from the city permanently.

The original improvement in her vision was retained without change in the correction of her refraction. It would appear therefore, that even in these very serious cases intervals of several months of monocular cycloplegia may be safely interspersed between periods of its binocular use, with greater comfort for the patient.

Obviously monocular cycloplegia will be of no assistance where the increase of myopia is due to increase in the index of refraction of the crystalline lens in patients beyond middle age. On the other hand the etiologic rôle of corneal scars and astigmatism in myopia is to be sought in the increased convergence required in such cases for satisfaction in near vision, especially when not using the best correction for their irregular refraction. Therefore, monocular cycloplegia may be expected to be helpful in such cases.

While this clinical application of a principle enunciated by Donders seems to promise definite aid in attempted control of progressive myopia, monocular cycloplegia does not furnish a full explanation for the incidence of myopia. The fact remains that convergence can be only a contributary factor in myopia. Otherwise, why may many emmetropic or hypermetropic patients continue without change in their refraction in spite of convergence in the steady use of their eyes in near work? A certain difference in the structural background must be assumed to account for the progressive stretching of the sclera in progressive myopia.

Poos[9] whose review of the myopic problem was made available through the translation by Dunbar Roy, states "that even the best established theories, the convergence hypothesis . . . cannot be deprived of the support furnished by that mysterious tendency toward myopia".

Couadau[10] in a study of unilateral myopia concludes that finally in spite of the lack of decisive arguments, one may admit that there exists hereditary transmission of a feebler resistance in the sclera to distension caused by the normal play of the visual function.

Tscherning[11] finding high myopia among illiterate peasants where the presence of the accepted causes for acquired myopia could not logically be expected to exist, concluded that a congenital impulse for a long, or myopic, eyeball might exist as well as the more frequent one for short, or hyperopic eyes. He added that the fact that eyes are not demonstrably myopic at birth does not eliminate the effect of heredity which may become manifest during the later growth of the body.

Comberg[12] recently suggested that simple myopia without pathological changes in the ocular tissues indicates almost exclusively the conformity to a natural hereditary impulse. My experience seems to justify Comberg's conclusions, but it cannot be denied that acquired myopia may be superimposed upon the hereditary type and confuse observations.

Research to discover a definite relation between myopia and the growth of bony skeleton with special reference to the orbit, has not yielded uniformly constant results. Just how much the general health or endocrine imbalance may influence the reaction of the ocular tissues to the stress of near work remains to be determined. That all are possible factors seems to be beyond question in the light of clinical experience and experimental evidence.

Levinsohn's[13] theory concerning the effect of gravity in increasing myopia deserves thoughtful consideration but it seems vastly more remote than the direct effect of convergence and passive hyperemia as postulated by Donders. Levinsohn's experimental evidence has not convincingly excluded the coincident effect of convergence.

Thorner's[14] idea that sudden stops and starts of the eyeball in fixing one word after another in reading produce a succession of tugs or pulls on optic nerve and sclera and thus cause the familiar lesions of progressive myopia about the disc and posterior pole seems rather farfetched and difficult of proof.

The criticism that it is highly imaginative may be entered in fairness against Comberg's proposal that sudden lid closure (blinking) supplies a blow of sufficient force when transmitted through the elongated myopic eye against its adipose cushion in the orbit, to account for pathologic changes at the optic disc and posterior pole.

It seems rather more reasonable to assume that in progressive myopia, a sclera with less than average resistance yields to the increased intraocular pressure incident to extraocular muscular action in sustained and excessive convergence. If this is correct the apparent success attained by monocular cycloplegia may be regarded as the legitimate result of providing for monocular fixation in near vision.

Monocular cycloplegia is not to be regarded as a substitute for, but as a temporary and occasional adjunct, to full correction and the other reasonable requirements for proper ocular hygiene and good bodily health in the control of myopia.

Hess[15] defines as a full correction for myopia, that glass which is found after repeated subjective tests with ordinary illumination, with normal-sized pupils and without cycloplegia to be the weakest that gives the best visual acuity.

Probably a larger series will reveal cases of myopia that will be progressive in spite of monocular cycloplegia, but my experience seems to justify presentation of the method with recommendation for its trial, subject to careful, continued observations as to the extent of its usefulness.

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References

[1] Donders, F. C. Die Anomalien der Refraktion und Akkommodation des Auges. Zweiter Abdruck der unter Mitwirkung des Verfassers von Prof. Dr. Becker herausgegebenen deutschen Originalausgabe, Wien, 1888, Wilhelm Braunmueller, p. 350.
[2] Gradle, H. Myopia. Reference handbook of medical sciences. 1885, v. 5, p. 92.
[3] Von Graefe, A. Quoted by Poos, see no. 9.
[4] Stilling. Quoted by Poos, see no. 9.
[5] Jackson, Edward. Norms of refraction. Trans. Sec. Ophth., Amer. Med. Assoc., 1931.
[6] Parsons, Sir John. Diseases of the eye. 4th edition, 1923, p. 479.
[7] de Schweinitz, George E. Diseases of the eye. 10th edition, 1924, p. 146.
[8] Purkinje. Quoted by Hess, see no. 15.
[9] Poos. The myopic problem. Translated by Dunbar Roy, Arch. of Ophth., 1929, v. 2, p. 73.
[10] Couadau, A. La Myopie Monolatérale. Travail de la Clinique Ophtalmologique du Prof. Frankel, Paris, 1929, p. 119.
[11] Tscherning. Studien über die Aetiologie der Myopie. v. Graefe's Arch. f. Ophth., 1883, v. 29, 1, p. 201.
[12] Comberg, W. Anatomische und experimentelle Untersuchungen über die mechanischen Faktoren der Myopiegenese. 47ter Ber. deutsch. ophth. Gesellsch., Heidelberg 1928, p. 126.
[13] Levinsohn, G. Neue histologische Untersuchungen kurzsichtig gemachter Affenaugen und ihre Bedeutung für die Myopiegenese. 47ter Ber. deutsch. ophth. Gesellsch., Heidelberg 1928, p. 131.
[14] Thorner. Discussion. 47ter Ber. deutsch. ophth. Gesellsch., Heidelberg 1928, p. 136.
[15] Hess, C. Behandlung der Myopie. Arch. f. Augenh., 1907, v. 56, p. 143.

SOME THEORETICAL AND PRACTICAL POINTS REGARDING UNILATERAL VOLUNTARY WINKING

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From a series of careful tests on a considerable number of patients it was observed that some could wink either eye with equal facility, some could wink one or the other eye more readily and some had difficulty winking either eye alone. It was noted that the poorer eye was usually the better-winking eye. This article is arranged from a thesis submitted to the faculty of the graduate school of the University of Colorado toward the degree of Doctor of Ophthalmology. Read before the Colorado Congress of Ophthalmology and Otolaryngology, August 2, 1930.

It has undoubtedly been noted by many oculists that people vary greatly in the facility with which they are able to wink one eye voluntarily while the other remains open. Indeed there are some persons who can wink one eye and not the other and others who can wink neither eye alone. The first reference to this that I have been able to find in the literature is a paper by Charles E. Rider[1] who presented a contribution on The Winking Test, before the American Ophthalmological Society in 1890. This paper dealt chiefly with the relation of unilateral winking to the vision in each eye.

The next reference to the subject is a second communication to the same society by Wheelock Rider[2] on Unilateral Winking as a Test of Comparative Visual Acuity. Edward Jackson states in the chapter written by him in Posey and Spiller's book[3] that one ordinarily winks the poorer eye. Charles Rider quotes Schmidt-Rimpler as saying in Ophthalmology and Ophthalmoscopy, 1889, in speaking of the ophthalmoscope, that "Some individuals find it difficult to close the one eye, and only learn it by long practice". In 1904, Howe[4] wrote, "We know also that a person ordinarily winks easier with one eye where the vision of that eye is more imperfect than that of the other eye". Litinsky[5] has recently written on the subject from the viewpoint of injuries. I have been unable to find any other statements or papers directly referable to the subject.

An eyelid is winked not only for protection, but also for uses related to vision and expression. The expressional use is in the "wink humorous" and the "wink critical". For an elaboration of the idea of the rôle played by the lids in expression, the reader is referred to the book by Darwin[6] entitled Expression of the Emotions in Man and Animals".

It is unfortunate that the word "wink" is so indefinite and has so many different connotations.[7] In this paper, the word "wink", unless otherwise stated, will mean a unilateral, voluntary sustained attempt at closing the lids of one eye, leaving the lids of the other eye open.

It is commonly known that in the quick bilateral wink, whether voluntary or involuntary, we use only the palpebral portion of the orbicularis oculi. In forced prolonged closing, however, we use also the peripheral or orbital portion, and in addition, to more or less extent, other muscles of the face. All these muscles concerned in closure of the lids are supplied by the facial nerve. The importance of controlling these accessory muscles in cataract extractions has been emphasized recently by O'Brien.[8] As will be seen in the photographs, in this paper, not only do these muscles come into play in forcible winking, but also in many people in attempts at closing one eye alone. If allowed to use these accessory muscles in winking, some people will seem to wink with equal facility with either eye, but if restricted to the use of only the central portion of the orbicularis, a marked difference can be elicited. Have the patient attempt to wink without even dropping the eyebrow.

In order to work out the relation of the winking to certain factors, about 500 clinic patients were examined. Each

patient was first asked to wink one eye, no hint being given as to which one. He was then asked to wink the right eye alone, and following this, the left eye alone. In those cases where there was a difference in the facility of winking the eyes (the unequal winkers), it was found that in practically all cases the person winked the better-winking eye when merely asked to wink one eye. The next step was to ask that both eyes be closed, then that one be opened. Following this, both eyes being shut, the right eye was opened alone and then the left eye opened alone. As would be expected, the "unequal" winkers complied in nearly every case to the order to "open one eye" by opening the poorer-winking eye. Thus a person who winks only the right eye well would have equal difficulty in winking the left eye or opening the right; this is illustrated in figure 1.

Those who cannot dissociate their winking or, in other words, cannot wink either eye separately, I have called nonwinkers. Those who wink each eye with equal ease are termed alternate winkers, with the subhead complete and incomplete. Those closing the eyes with unequal facility have been called unilateral, winkers with the subheads right or left, and complete, definite, or indefinite. Seven percent of the subjects were nonwinkers, 33 percent were alternate winkers, 29 percent were right winkers, and 31 percent were left winkers.

Fig. 1 (Danielson). A right winker. Opening the left eye or closing the right eye, or vice versa, gives the same appearance. The sternocleidomastoid phenomenon is elicited in closing the left or opening the right eye. This patient has had recurrent corneal ulcers of the right eye for seven years.

It was the contention of the Riders that as a rule we wink our poorer eye. This is substantiated by my work. For example the right winkers showed twenty-six or 18 percent with vision of the right eye better, thirty-eight or 27 percent with equal vision, and eighty, 50 percent, with the left eye better.* Therefore, the ratio of right vision better, to left vision better, was about one to three in right winkers. Furthermore, the degree of difference of vision seemed to have an effect, for in the right winkers with a marked difference in vision there were eleven with right eye better and fifty-four with left eye better, a ratio of one to five. To carry this even further, in the group of greatest difference in vision, the ratio was one to thirteen. It was also found that there was more tendency to unilateral winking if both eyes of those with equal vision in each eye had good vision. And again, although the number of people who had a marked difference of vision was about equal to the number of those with slight difference of vision, yet in the group of complete unilateral winkers there were twice as many with marked difference of vision. Among the complete unilateral winkers who had a marked difference in vision, there were nineteen who winked the poorer eye the better and three who winked the better eye the better. The general conclusion seems warranted, therefore, that the eye with the poorer vision is apt to be the better winker, and that a better winking eye is probably the one with the poorer vision. Furthermore, these tendencies are enhanced by greater difference in vision or more pronounced unilateral winking. In studying the alternate winkers no marked preponderence was found in any group. Nonwinkers showed a tendency to equal and poor vision. Those interested in the effect of vision on winking should read the papers by the Riders.

Now that we hear so frequently about the dominant eye it seemed desirable to check the relation to winking. Of the 158 patients with the right eye dominant, there were seventeen right winkers, seventy-three left winkers, fifty-eight alternate winkers, and ten nonwinkers. The striking fact here is that the ratio of right winkers to left winkers is about one to four and five tenths. With the indefinite winkers the ratio is one to three; with the definite winkers, one to five; and with the complete winkers, one to thirteen. With the left-dominant group the inequality is just as marked, the right winkers far outnumbering the left winkers. The general rule is warranted then that the dominance is usually opposite to the winking preference.

We have all noticed that when we are suddenly confronted by a strong light we can make ourselves much more comfortable by closing one eye. Blondes naturally are more sensitive to light than brunettes. It was, therefore, an interesting conjecture as to whether the varying amount of protective pigment would have any influence on the ability to wink. Apparently the amount of pigment does have a modifying influence, for a much higher percentage of blondes than of brunettes was found to be able to wink alternately with facility.

People who have an equal error of refraction have an equal chance of being right winkers or left winkers. In emmetropia there is a tendency toward left winking. Of the unilateral winkers who are myopic or hyperopic there are many more who wink the eye of greater error of refraction. This preponderance is even more exaggerated in the groups of greater difference in refraction. For instance, of the people with a difference of more than one diopter of hyperopic astigmatism between the two eyes, there were five who winked the eye of lesser error better, and twenty-nine who winked the eye of greater error. The alternate winkers and nonwinkers show no tendency to belong to any particular group.

It is conceivable how an error of refraction might be the factor which

* These deductions are obtained from tables published in the complete thesis, which may be procured from the Librarian of the University of Colorado at Boulder, Colorado, or from the Library of the City and County of Denver.

would tend to determine the type of winking. We all know that squinting the lids increases the visual acuity, and could not the advantage of squinting the eye with the greater error of refraction be a starting point for building up the habit?

During the course of this study it was noted that many people have a tendency to turn the eyes toward the winking side. Indeed some individuals could not wink unless the eyes were turned to that side (see Fig. 2). Another interesting observation is that a part of the grimaces in difficult winking is frequently a contraction of the sternocleidomastoid muscle on that side (see Fig. 3). Both this associated eye movement phenomenon and this sternocleidomastoid phenomenon are to be described and published more fully later.

Miscellaneous items and cases

I believe with the Riders that men wink better than women, probably because of occupation. Nonwinking in adults seems frequently to be associated with subnormal mentality. The winking ability of a patient seems to be quite definitely established between the fourth and tenth year, although

Winking right eye | Winking right eye, left lid held up | Winking left eye

Fig. 2 (Danielson). The associated eye movement phenomenon. The left eye is seen to be turned definitely to the right and slightly up.

Attempting to wink right eye | Both open | Winking left eye

Fig. 3 (Danielson). This girl, a left winker, shows the sternocleidomastoid phenomenon on attempting to wink the right eye (shown in photo at left). Note the muscle and the typical head pose.

prolonged influences could have a modifying effect after that. In one case of marked facial asymmetry, I noted that the patient winked better on the smaller side. The majority of the convergent strabismus cases wink the nonfixing eye the better.

It would be very interesting to run a series of cases of very young children and see what influence the vision, errors of refraction, dominance, conjunctivitis, foreign bodies, and so on, might have even at an age before any conscious sighting with one eye might be involved. Why should such a great percentage of people evidently be definitely "handed" even at an early age, more than those who are definitely one-sided in their winking ability? Can it be due to bilateral innervation of the muscles of winking?

Theoretical and practical points

Some of the interesting details under this heading were suggested by the Riders and are here elaborated. The person who has difficulty with one eye in using an ophthalmoscope has it frequently not only because he is attempting to use a defective eye, but also because he is unable to close the good eye easily. I might add that this applies to some persons in using the microscope, in shooting a rifle, or in the act of sighting. In one case of mine, difficulty was experienced also because of the associated eye movement mentioned above.

If a patient has a paralysis of an extraocular muscle on one side, the ease with which that eye can be kept closed will depend almost entirely on the winking group to which the individual belongs (and of course whether the lid is also paralyzed). If the paralysis is in the better-winking eye no difficulty will be experienced, if in the poorer-winking eye there will be considerable discomfort and more necessity for covering the eye. Nonwinkers will have difficulty, but alternate winkers no trouble. The symptoms will likewise vary with painful, inflammatory lesion with tendency to closure of the lid, depending on whether the affected eye were the better-winker or the poorer-winker.

We are confronted at times by the patient who has a defective eye and does not know it. Examination will usually reveal difficulty in winking the eye with the better vision. In such a case reported by Agnew,[9] probably the patient could not wink his better eye. Some of these patients become quite disturbed at the insinuation that they have always had a defective eye, and remark, "If I had had a poor eye I would have known it". The winking explanation will usually serve to help the patient understand. In a compensation or a malpractice case it would certainly aid a jury in comprehending how such ignorance of poor vision could exist. One may point out that winking the poorer eye does not markedly affect the vision, while closing the better eye reduces the vision to that of the poorer eye.

If a patient complains of recent sudden loss of vision in one eye, one would be much more apt to give the statement credence if one finds that the person is a good winker or that he winks the unaffected eye better, than if he is a nonwinker or winks the affected eye better. A patient who is a good winker is more apt to discover a defect in vision soon after the onset. Nonwinkers and unilateral winkers often do not discover poor vision until the good eye is accidentally covered. I had several such cases in this series. Furthermore, one is more apt to become cognizant of decreasing vision in the dominant eye, not only because of disturbances in alignment, but because of the fact that it is the nondominant eye that is usually winked the better.

To elaborate further on the time factor, I believe from my present work that the winking ability is determined in early childhood and persists throughout life much the same as handedness. Only one patient has told me that his winking has changed, although a large number knew about their peculiarities of winking all their lives. Some had voluntarily tried to change their winking habit, and some made an effort

for several months at my request, but not one reported success. If then, a person winks one eye better than the other, the presumption is that it is his poorer eye and always has been so. The malingerer would have extreme difficulty in changing his habit, especially in a short time. While I have not had a sufficiently large group for dependable data, I am quite certain that the only condition that will ordinarily ever markedly change or reverse a unilateral winking habit or modify a nonwinking condition is a unilateral painful lesion associated with blepharospasm. For example, recurrent corneal ulcers could, I believe, change the winking ability in favor of the eye affected. In fact I had one case in which it apparently did. A mere change in vision of noninflammatory etiology and nonpainful nature is, in my opinion, insufficient to cause a definite change. Dominance would probably be more apt to change with reversal of visual acuity. One medical student reported a slight change in his winking ability from prolonged use of the microscope with one eye.

If a man has injured an eye in some manner, and examination reveals insufficient evidence of the injury's being the cause of the poor vision, one may try the winking test. If the injured eye is the better-winking eye the presumption is that the poor vision has been present a long time and that the injury is coincidental. If, on the other hand, the uninjured eye is the better-winking eye, then the chances of the lowered vision's being due to the injury are enhanced; in other words, one would expect the poorer-winking eye to have been a good eye in the past and any lowered vision to be due to some recent etiology. The test is, then, of some value in deciding between recent and old etiology in a particular case, if there is a difference in winking ability between the two eyes. When taken in conjunction with dominance, it would have added value. In the same manner one might differentiate between some old abnormal refractive condition and one of recent origin.

The test may also be applied to help determine which eye has been better in the past when both have poor vision now. For example, in deciding which eye with mature cataract should be operated on, it would be better, other things being equal, to chose the poorer-winking eye, if that is demonstrable. Indeed we had a case in the clinic of bilateral mature cataracts in a Mexican woman. One eye was operated on, and, although the surgical result was good, very little vision could be obtained. By then talking to the patient quite a while in her own tongue we found that she had never seen well with this eye. She was able to wink this amblyopic eye, but not the other. Removal of the cataract on the nonwinking side resulted in good vision.

This work emphasizes the well known observation that the eyelids tend to work together in their movements. It sheds some light on the fact that when we are examining one eye the patient can hold it open better if he is instructed to hold both eyes open. This admonition is one which has to be given frequently. Dr. Edward C. Ellett reiterated to me the necessity of this in surgery if one is to have the lids of the operated side relaxed. Furthermore, when a patient turns an eye in, while closing the other, in spite of one's request to look straight ahead, one will have more patience with him by realizing that this is the associated eye movement reflex I have mentioned above. One is reminded of the oculofacial reflex in which some patients cannot keep from looking up when the lids are held open by the examiner.

Many of the patients, especially those who winked with difficulty, would attempt to hold the eye shut with the hand. When the lid was so held, the face would lose the contortions and become placid, because it was unnecessary to dissociate actively the impulses going to each eye. This explains why a dressing over the eye is not as uncomfortable as one would expect in

covering a poor-winking eye. A tightly fitting dressing should be more comfortable than a loose one. Two patients told me that they felt more at ease when their better-winking eye was held shut than when the poorer-winking eye was so held. Possibly akinesia is more indicated in operating upon a definitely better-winking eye, because the operated eye will be more apt to squeeze when the nonoperated (poor-winking) eye is closed.

A point for the neurologist is that unilateral winking and nonwinking apparently have nothing to do with paralysis or paresis of the facial muscles. Unless one knew of such a thing as unilateral winking, one might be unwittingly deceived if the patient should be asked to wink alternately.

Unilateral winking works to the benefit of the individual as far as winking the poorer eye is concerned, but it has one theoretical disadvantage. If one were exposed to some danger such as intense heat or flying debris, although the protective reflex would be to close both eyes, one eye would have to be partly open to direct the reactions intelligently. The good eye would open and, therefore, be subjected to greater danger. Might this not be a factor in determining the eye affected in glassblowers' cataract? In driving an open car in the wind or cold, one eye must remain open and consequently be more subject to trauma and danger of foreign bodies. If a foreign body should strike this open eye in a unilateral winker the eye could not be closed alone. Both eyes would have to be closed and an accident might result. Both eyes would also close when the poorer-winking eye were struck even though both eyes were open at the time. Should the person also have an associated eye movement reflex, this would add to the difficulty. An injured better-winking eye could be held closed separately, leaving the other eye open with which to see. It is at least suggestive that nonwinkers and unilateral winkers should be especially careful to wear glasses for protection when under dangerous conditions. Since writing the above statements in my thesis the article by Litinsky[5] has come to my attention in which actual figures bear out the above conjectures. He shows that the great majority of eye injuries occur in the dominant eye. Dr. John Osburn of Los Angeles told of a case where the better eye was injured by looking at an eclipse; the patient probably winks the poorer eye better, according to the rule.

I wish to thank Dr. Edward Jackson for suggesting the subject for this thesis. Miss Mabel Anderson kindly helped in looking up the literature. I am deeply indebted to Dr. Melville Black and many other members of the faculty for much help. Dr. Wm. H. Crisp gave valuable assistance in nomenclature.

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References

[1] Rider, Charles E. The winking test. Trans. Amer. Ophth. Soc., 1888-90, v. 5, pp. 551-559.
[2] Rider, Wheelock. Unilateral winking as a test of comparative visual acuity. Trans. Amer. Ophth. Soc., 1897-99, v. 8, pp. 434-452.
[3] Posey and Spiller. The eye and the nervous system. Chapter VII.
[4] Howe, Lucien. On the act of winking and its photographic measurements. Trans. Amer. Ophth. Soc., 1904, p. 332.
[5] Litinsky, G. A. Injuries to the surface of the eyes from the standpoint of functional asymmetry. Russkii Ophth. Jour., 1930, May, pp. 617-630.
[6] Darwin, Charles. Expression of the emotions in man and animals. 1898, D. Appleton & Co., New York City.
[7] Blount, W. P. Studies of the movements of the eyelids of animals: blinking. Quart. Jour. Exper. Physiol., 1927-29, v. 18, p. 111.
[8] O'Brien. C. S. Akinesis during cataract extraction. Arch. of Ophth., 1929, April, v. 1, p. 447.
[9] Agnew, C. R. A case in which the sight of one eye was so imperfect as to be practically useless without the consciousness of the patient. (Reported by Webster) Hosp. Gazette, N.Y., 1879, v. 6, p. 276.

NOTES ON MUSCLE AND FUSION TRAINING AND ORTHOPTIC TREATMENT OF MOTOR ANOMALIES

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Exercises of this nature are advocated in numerous functional disorders, as certain psychoneuroses, strabismus, intermittent suppression, monocular suppression amblyopia, weakness of accommodation and convergence, and the like. Benefit may be derived even in glaucoma, myopia, and nystagmus.

The refractionist of today is slowly becoming conscious of the fact that many asthenopic symptoms are due to causes other than errors of refraction. It is surprising, in view of the work of Donders, Duane, and others on the study of asthenopia that many ophthalmologists prescribe lenses without considering the extraocular and intraocular muscles. Frequently, not even the accommodation is measured.

Prism exercises are sometimes half heartedly tried and discarded before their true worth has been determined in the treatment and their value in subnormal accommodation, as shown by Duane, is not even thought of.

Ophthalmologists have long noted the association between asthenopia and functional nervous disorders and even though Stevens possibly overstated the importance of heterophoria in this matter, cases which illustrate the importance of this relationship are frequently encountered in practice.

S. Weir Mitchell, de Schweinitz and others have stressed the importance of correcting errors of refraction in functional nervous disorders, but refraction and the neuromuscular apparatus should receive simultaneous study.

In our modern life the strain on nervous systems produces many functional neurologic disturbances which may be classed as psychoneuroses. Many of these patients have eye symptoms and their nervous condition is exaggerated when using their eyes. They frequently are tested for glasses and often have their optical errors corrected but lack an analysis of the fusion faculty and the convergence-accommodation.

These symptoms may also be attributed to all sorts of causes such as impending nervous breakdown, anemia, uterine displacements, endocrine disturbances, and so on, and these patients are classed as neurotics. In all chronic or semichronic diseases, the psychoneurotic factor must be considered. And often it may be difficult to tell which was present first.

An examination for underlying causes of psychoneurosis is not complete without analysis of errors of refraction, the fusion faculty and the accommodation. The works of Claude Worth, Verhoeff, Duane, and Wells seem to have but slowly impressed the profession with the importance of these functions. The studies of Wells[2] and their application to the phoropter stereoscope have given new impetus to this. They have been utilized in the treatment of strabismus and deserve even wider popularity. Stereoscopic and other orthoptic exercises have a broad field in the treatment of asthenopia and other obscure functional eye conditions.

Many patients who have suffered from a "nervous breakdown" will be restored to normal by treatment of the ocular disorders after careful examination. Any debilitating disease or condition that lowers the nerve energy exaggerates the eye symptoms. Improvement in the general health, and rest of the eyes give temporary relief. I would

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These notes constitute an outline of the course given in the Section of Instruction of the American Academy of Ophthalmology and Otolaryngology at its St. Louis Meeting, October 15, 1928. I wish to thank Dr. Conrad Berens of New York for his assistance in revising them. They were not written for publication but in response to numerous requests, I have submitted them for publication. They present briefly the clinical application of orthoptic exercises. For the study of the extrinsic muscles, I would recommend Luther Peter's new book.[1]

also mention briefly in passing, the importance of nasal sinus disturbance. I have found it to be an important factor in many so-called muscle cases. It is futile to expect to restore normal muscle balance in the face of a chronic sinusitis. In considering obscure headaches associated with use of the eyes, the sinuses must be considered.

Some oculists have recognized the nervous factors caused by difficult and abnormal binocular fixation and have even advocated monocular occlusion to prevent it. Comfortable vision without nerve irritation is rather to be desired than the maximum of binocular visual acuity but monocular occlusion should not be used except for diagnosis or as a last resort. Prolonged monocular occlusion is of value in making a diagnosis of anomalies of the extrinsic muscles (muscle imbalance) particularly hyperphoria. Refraction with or without cycloplegia does not reveal it.

Study of the fusion faculty, perspective, projection, binocular fixation, and other functions, impresses one with the fact that many conditions heretofore attributed to the extrinsic muscles are only manifested there. The cause is usually found associated with faulty innervation.

Nature accomplishes monocular suppression quite often, always of the poorer eye or the one with the higher error of refraction. This has given rise to the theory of a "master eye". The refractionist is justified in producing or allowing suppression to exist only if single binocular vision cannot be obtained by methods herein described. Muscle imbalances may be associated, however, with errors of refraction and partly relieved by the correction.

Case 1. Helen S., aged 23 years. Alternating convergent strabismus since childhood. Anisometropia: O.D.+1.50 D.sph.⊂+.25 cyl.ax. 90°; O.S.—3.25 D.sph.⊂—50 cyl.ax. 45°; corrected vision, was 20/15 in each eye. She could alternate fixation and suppress either eye at will. Both external recti were advanced at the same time. Pictures taken two days after operation showed eyes straight. Fusion exercises were useful. Fuses large objects but not small ones. Still suppresses one image at times. Distance fixation exercises very beneficial.

To obtain and maintain comfortable binocular single vision, we must have parallel visual axes so that images fall on nearly corresponding areas of the retinæ, and also, there must be adequate development of the fusion faculty. Verhoeff[3] brought out that the fusion of images on non-corresponding points of the retinæ enables us to enjoy perspective. These areas must be quite close together and it is for that reason the author advocates operation on both eyes at the same time in alternating convergent strabismus by means of a double advancement of the externi. I wish to emphasize this point as the authors I have consulted advise operating on one eye at a time. I have been successful in developing binocular single vision and fusion after operation on a considerable number of alternating squints. The Hering Drop Test is one of the most reliable known for determining depth perception. It does not, however, necessarily indicate highly refined fusion.

Abduction and adduction tests at the twenty foot distance are of secondary importance and incomplete inasmuch as the convergence accommodation reflex is not then operative. Where faulty fusion exists and treatment is instituted, it is not uncommon to see an esophoria change to exophoria or vice versa. This is particularly true if the accommodation has been strengthened as a result of the treatment. When the fusion faculty is well developed the extrinsic muscles have sufficient power to overcome most of the phorias. It was formerly my policy to correct all hyperphorias as soon as I found them. I did not believe they would be improved by treatment. I have found, however, that many hyperphorias disappear or decrease with the exercises we are now using. The final prescription should contain sufficient prism strength to correct the remaining hyperphoria.

We are today concerned with the interpretation of the studies of physio-

logic optics into methods that can be employed by the clinician. First of importance, as stated by Peter, I would place the correction of errors of refraction. I shall not discuss it except to state that a weak eye should be stimulated to function by having its optimum refractive correction and the better eye retarded.

In high esophoria or esotropia, the full hyperopic correction should be prescribed. An addition should be given by means of bifocal lenses for near point work. Cemented segments are practical and satisfactory. Prisms, bases-out, or decentration of lenses may be used temporarily. After fusion is obtained and refined, the base-out prisms should be discarded and prisms, bases-in, should be used for exercise.

Our attention has been called to the value of base-in prism exercises in convergent strabismus by cases like the following: A young lady of 29 years, operated on when a young child by tenotomy, came under my care ten years ago wearing a six-degree prism, base-in, over a partially amblyopic eye. I thought it had been turned or improperly placed in the frame. I have repeatedly tried to reduce it or discontinue its use but the patient is not so comfortable without it nor does she see so well.

The other case was one of convergent strabismus. The patient was given a set of loose prisms to be used, bases-out, for exercise. Fusion was not yet developed. I did not see this patient for several months and when he came back there was a marked improvement and good fusion. I was surprised to find he had been using the prisms bases-in, just the opposite from the way he had been ordered to use them.

These good results can be explained only by reasoning that the physiologic antagonistic muscle innervation is stimulated or that an unused or undeveloped retinal area is stimulated or that abnormal retinal correspondence is present. These explanations seem entirely inconsistent with our present theories but the practice is effective, nevertheless.

The bifocal segment for near should be gradually weakened and discarded as fusion and accommodation are developed. The distant hyperopic correction also should be weakened as accommodation develops. Glasses may possibly be discarded under the following conditions; in cases where the visual acuity or refractive error is the same in both eyes, where the accommodation is the same or can be brought up to normal, where no pathological condition exists, and where no asthenopic symptoms are caused by use of the eyes. Some patients do well with a considerable error of refraction by exercising the muscles and using their correction for the near point only. Patients whose general condition is poor should not consider going without the indicated correction even though they may have done so when well.

Exercises for fixation, orientation and coördination

As we consider the methods by which children learn to see, we are impressed with the psychic and mental elements. We cannot discuss the theories for lack of space, but I would recommend them for your consideration. The child or young adult should study distant objects, both stationary and moving. Exercises with weak prisms as described by Savage may be used in conjunction with these.

I would mention as a demonstration of the lack of orientation and fixation, a lady who had been blind for thirty years from posterior polar cataract and annular synechia. We restored partial vision by making a new pupil. At first, she had no sense of direction in turning her eyes or fixing. There was no coördination between her vision and movements. She had no judgment of distance, depth or the relation of objects. We would tell her to look straight ahead and it meant nothing whatever to her. She is slowly acquiring fixation and orientation.

Excursion and fixation exercises are frequently used. Briefly they consist of exercises that cause the eyes to turn rhythmically in all directions while fix-

ing objects that tax retinal perception. There are a number of commercial instruments on the market for this purpose.

The mental stimulus generated in the cortical and subcortical centers by first eliciting the patient's attention and then causing him to fixate objects, is a therapeutic measure of much merit. It is accentuated by continuing the attention and fixation while the eye is moving in all directions. There is, also, a psychic stimulus in arousing in the patient a desire to see distinctly. A moving light (red or green) is projected on a white screen in front of the patient. The light is moved through different meridians and then in circles. The circles are at first small and then gradually increased. The rapidity of movement is increased as the patient learns to keep up in moving his eyes. The patient follows the light without moving the head. We later have them hold an electric torch light in the hand and cover the moving light. Prisms, bases-in, are used with this exercise. We also use a projecting light on a head band with the patient directed to cover the moving light, moving his head as it moves. For all the above exercises, the amblyopic eye is used and the better one covered or a red filtering glass is worn before the good eye. This causes the eyes to perform natural movements at the same time it elicits attention and fixation. It also arouses in an amblyopic eye a desire to see, and the base-in prism stimulates the opposing muscle. After a double advancement for alternating strabismus, both eyes are exercised uncovered.

Intermittent suppression is a common condition and found associated with exophoria at the near point. Convergence insufficiently is primarily caused by faulty or unrefined fusion faculty and subnormal accommodation. They are amenable to treatment by the Wells' system of exercises and the accommodation and orthoptic exercises we are describing. As a rule, the combination of esophoria and myopia should be fully corrected and exophoria and hyperopia undercorrected. Systemic dyscrasias should be searched for in hyperopia with weak convergence. Anemia and hyperthyroidism are frequently found.

Suppression is regularly associated with esotropia and common with esophoria. It is nature's effort to get rid of a blurred image or diplopia. If it exists for any length of time, amblyopia develops. The treatment of the latter is more difficult.

The development of active and refined stereoscopic vision is very important. The Wells apparatus measures accurately the amplitude of fusion.

Exercise is of value in the treatment of paralysis of the extrinsic muscles. The earlier it is instituted the better. The etiology is important.

Case 2. Mrs. McK., aged 72 years, came to us with a left third nerve paralysis which had come on suddenly two weeks before. The left eye was divergent 35 degrees and there was a complete ptosis of the upper lid; pupillary reaction was greatly diminished. Blood Wassermann was negative. Fusion exercises and ocular calisthenics were used along with tonics internally. Six weeks later there was some esophoria, but diplopia was present only on looking to the extreme right. No antiluetic treatment had been given although later "mixed treatment" tablets were given in small doses. The condition had cleared up entirely in six months.

Case 3. Mr. C., aged 48 years, had convergent strabismus of 32 degrees associated with an attack of hemiplegia involving the left leg and arm and the right side of face and the right external rectus muscle. He had had very high blood pressure for several years, and had been a hard worker. His blood and spinal fluid Wassermann reactions were negative. Advancement of the external rectus and fusion exercises gave him almost complete relief, leaving slight diplopia on looking to the extreme right. A second and more severe stroke has since occurred but did not involve the eyes.

Amblyopia

In considering amblyopia, we are considering a functional condition. The patient, usually a child, must learn to see. He must first learn to give attention to visual images and then to fixate with the two eyes simultaneously. He must learn to judge distances, the comparative size of objects, and their location. He must learn to coördinate his movements with vision. Learning to see is, therefore, a mental education and development.

The child who has anisometropia, unequal development of the accommodation, or a faulty position of the globe that has originated during fetal life, is liable to have heterophoria of some degree. As Worth pointed out "he is not liable to actual strabismus or squint if his fusion faculty develops in spite of the other handicaps". The development of good eyes consists, then, of the development of the fusion faculty, training the mind in fixation, perspective, projection, orientation and normal movement of the eyes. We must also consider that with these defects, the convergence-accommodation reflex has not been stimulated or developed.

Infants have accommodation estimated as high as twenty diopters associated with an excessive convergence and an inability to see distant objects due to the amblyopia of infancy, as Priestley Smith points out.

I predict in the not distant future it will be considered expedient that young children have their eyes tested before entering school and an effort be made to correct deficiencies before the strain of school work overtaxes the eyes and the nerves of the developing child. This should include tests for fusion and convergence-accommodation as well as for refractive errors.

Case 4. Howard N. aged 5 years, was brought to me because of alternating convergent strabismus. Both external recti were advanced at the same time. He had always stammered badly, but this ceased immediately following the operation.

It is important when the child is performing the excursion exercises that he be fixing some object that he recognizes. Rhythmic turning and fixation exercises are ideal. Witness the mental stimulation of the dancer or soldier when rhythmic music is played.

Protracted covering of the good eye is first used. We, later, place a red glass before the good eye and have the poor eye view and study red objects. Peckham[4] reports good results in the use of red in stimulating the amblyopic eye. From a limited experience with this, I have been favorably impressed. Red objects are especially good for children and there are numerous movable red playthings that can be used for this purpose. The excursion fixation exercises are given daily at the office. Moving picture exercises are easy and retain the child's interest. The good eye is covered and the weak or partially ablyopic eye views the picture. This elicits attention and fixation and stimulates accommodation. Prisms may be worn while viewing the pictures and binocular stimulation also will be accomplished. These can be supplemented by a small moving picture outfit in the home or at the office for a number of children. Study of a Snellen chart or other colored objects at gradually increasing distances is a valuable home adjunct and may be used two or three times a day.

The recently developed colored motion picture films would seem to offer valuable possibilities for stimulation of stereopsis. With red and green objects projected on the screen and with red and green lenses worn by the patient, it is easy to see the many advantages that might be gained in the way of exercises.

In seeking to restore function to an amblyopic eye, we are truly laborers in the great cause of prevention of blindness. It is quite common to see in adult life, an eye that has been allowed to lose its entire function. Then, if some accident or disease causes a loss of vision in the good eye, the patient will be condemned to blindness, whereas, if the amblyopic eye had been conserved in early life, he would have had one eye in reserve.

After study of the clinical results obtained when using the Wells' stereoscopic exercises, I was particularly impressed with the fact that accommodation was being stimulated and developed; this in spite of the retarding effect of strong plus spheres. This result is obtained by stimulation of the convergence-accommodation reflex and some of our good results have been obtained in this manner.

Several cases where accommodation was developed by stereoscopic and other exercises have been called to my attention. I wish to emphasize now this factor obtained with the Wells' exercises combined with the others I have mentioned in this and the previous paper. The development of the fusion and the convergence-accommodation reflex are intimately associated or linked. Wells and Duane believe that cases classed as subnormal accommodation are comparatively few. I believe they are numerous. It is true that cases where the accommodation is found perceptibly below normal are not so frequent. It is, however, true that many cases are found in which the clinical symptoms of asthenopia and psychoneurosis are relieved by stimulating and strengthening the accommodation. In many instances the accommodation becomes active and strong enough so that glasses can be dispensed with wholly or partially. This is particularly true with children and young adults.

Duane pointed out that people who wear glasses will be benefited by having their accommodation strengthened. I would especially recommend the study of Duane's work on "Subnormal accommodation"[5], particularly his observations regarding dynamic insufficiency without iridoplegia. His accommodation table published with this work is the most exact yet compiled. The bar reading exercise and other exercises referred to by Duane are very valuable. The same theory and treatment can be applied to people who have asthenopia and do not wear glasses, provided certain conditions are not present.

We must exercise rare judgment in advising our patients to dispense with lenses. Such advice should be given only after a thorough examination and analysis of the case. It is then safe to give it only to patients who are under observation. We can combat the propaganda of the radical by pointing out to our clientele and the public the limitations of exercise treatment. It is believed by some that pterygium, cataract, glaucoma, and many of the other serious eye conditions may be exaggerated or may even be wholly caused by uncorrected errors of refraction. Patients with lowered vitality, focal infections, and debiliating diseases, pregnancy, sinus disease, and others, should be very cautious in dispensing with correcting lenses. Two cases are mentioned in a former paper[6] in which lenses were discarded and statements made as to how and when we should dispense with glasses.

In treating such conditions, it is necessary that the ophthalmologist have the coöperation of a competent internist. It would be the height of folly to institute excercises without a complete analysis of underlying physical conditions. As an example of the uselessness of such a line of treatment, I wish to cite the following case.

Case 5. Mr. L. T., aged 47 years, whose vision had been failing gradually for several years, came to us for a cataract operation. He had been advised by an ophthalmologist at home to dispense with his glasses and to use ocular calisthenics, which advice he carefully followed. Shortly afterward, the opacity of the right lens began to increase very rapidly. It was then discovered that he had a very high blood sugar.

It must not be inferred from this that exercises do not help in certain cases of incipient cataract, as adjuncts to other forms of treatment. The point I wish to make is that too much dependence cannot be placed on their use to the exclusion of other measures.

On the other hand, the profession has been altogether too hasty in prescribing glasses for children and young people instead of seeking to remedy the underlying condition. I think, however,

that it is exceedingly important that we should stimulate the interest of the refractionist in the study of fusion, accommodation and orthoptic exercises and the possibility of dispensing with glasses in suitable cases.

When we study the accommodation and its relations, many interesting avenues present themselves. As we analyze subnormal accommodation and consider the symptoms and the underlying constitutional factors, we are impressed with the fact that they present a distinct parallel to those of beginning glaucoma or preglaucomatous conditions.

Several of Duane's[5] case reports are very suggestive of preglaucomatous conditions. The underlying constitutional conditions are the same. Lowered vitality is a factor in both. The tendency to a slow or dilated pupil is present in both conditions. The earlier symptoms of discomfort are very similar. Both conditions are prone to occur in the nervous, high-strung individual, who is called on to use his eyes to excess.

Glaucoma usually occurs in the period of life during which the accommodation is failing and it is most frequent in hyperopic eyes. In view of the demonstrated pumping action of the ciliary muscle in aiding circulation of the aqueous, according to Thomson's[7] hypothesis, and certain clinical facts, such as an increase in tension after the night's rest, it seems possible that exercises tending to increase the activity of the ciliary muscle can be of great assistance in the treatment of early noninflammatory glaucoma. Here, again, exercises can be used only in conjunction with other treatment.

In a recent personal conversation, Elliot expressed the opinion that such exercises might accomplish a great deal, because of this pumping action of the ciliary muscle. It conforms to Elliot's[8] statement that weakness of accommodation is the first sign of glaucoma.

Exercise for myopia

The excursion fixation exercises are given daily at the office and the distance fixation exercises with the Snellen chart are advised for ten-minute periods twice a day without correction and with both eyes uncovered. They are of some value in myopia and false myopia caused from excessive convergence and accommodation. Exercise with prisms, bases-in, and sometimes incorporated in the prescription, will aid in retarding excessive convergence. This combined with the use of a plus addition for near work, given as a bifocal lens, seems to have a definite value in the treatment of myopia. In myopia, the indication for cycloplegia in refraction is very positive as it prevents over-correcting. Attention to general health and endocrine disturbances are of great importance.

Case 6. Mr. C. E., aged 24 years, an office worker, was first seen three years ago complaining of severe asthenopic symptoms. Concave glasses had been worn since the age of 7 years and had been changed twelve times, the last change having been made one year before. At the first examination an increase in power of both sphere and cylinder was noted. Full correction was ordered, with a near point addition of plus 1.50 D.sph. in a bifocal lens. Excursion fixation exercises were given daily at the office and twice a day at home, together with general tonics, and the asthenopic symptoms promptly disappeared. When last seen a few weeks ago, he was entirely comfortable and there had been no further increase in the myopia.

Nystagmus

I have found that fusion and fixation exercises often produce marked improvement and sometimes a cure in this seemingly hopeless condition.

Case 7. Miss R., aged 20 years, a school teacher, showed a rapidly oscillating lateral nystagmus with a slight rotatory component. This had been present since birth and troubled her a great deal during work at the near point. For distant vision, no blurring was noted with the eyes in primary position but on looking to the right, she became conscious of the nystagmus which increased in frequency and excursion. Glasses had been worn since the

age of eight years. She was wearing, when first seen, O.D. +.50 cyl. ax. 90°; O.S. +.25 D.sph. ⊂ +.50 cyl. ax. 90°. This was changed after examination under cycloplegia to O.D. +1.75 D.sph. ⊂ +0.75 cyl. ax. 105°; O.S. +1.50 D.sph. ⊂ +1.00 cyl. ax. 85°. Vision with either correction was 20/20 each eye. Later, +0.75 D.sph. was added for reading.

After four months' treatment, consisting largely of fusion and fixation exercises, the nystagmus was barely noticeable on close examination and the patient was perfectly comfortable. The excursion fixation exercises were given daily at the office and fixation exercises were taken for fifteen-minute periods three times a day at home.

Of course, as good a result as this is hardly to be expected in cases where the visual acuity is greatly reduced, although, even in such cases, improvement is the rule.

Aphakia

Fusion exercises are very beneficial in aiding a patient to overcome diplopia following cataract extraction if good vision is obtained in the aphakic eye. Exercises are, however, difficult to administer and only the larger objects can be fused. Because of the disparity in size of the two images, fusion of small objects and details is impossible. Nevertheless, the ability to fuse large objects aids greatly in minimizing discomfort due to diplopia. Several cases have been observed where large objects would be fused and intermittent suppression would occur for smaller ones. If both eyes are aphakic and both have good vision, exercises again are beneficial, especially if one or both eyes have had markedly reduced visual acuity over a long period prior to the cataract operation as is often the case. Correction must, of course, be worn in either case.

The exercises are given preferably on the Wells phoropter. The regular stereoscope can be used but with considerable difficulty. The author has cataract lenses precisely ground and placed before the eye. The strong spheres are then decentered to gain prism base-out effect or when the regular stereoscope is used, the cataract lenses are worn in a frame. A great deal of patience is necessary at first.

Case 8. Mr. T. H. D., aged 49 years, alternating strabismus since childhood, came to us for cataract removal. The left eye had only light perception for four years. Barraquer intracapsular extraction gave vision of 20/15 and Jaeger 1. Fixation and fusion exercises were beneficial. He was able to fuse large objects, but on account of the disproportion of images, he experienced considerable difficulty, but treatment reduced the esotropia from 35 to 10 degrees.

The improvement in functional eye conditions following the use of orthoptic exercises is usually attributed to psychic or autosuggestive factors. This may well be the case but when one considers the large area of cerebral cortex directly or indirectly subject to sensory impulses arising in the eye and its adnexa, we can begin to comprehend the scope of treatment directed at its disturbed function.

It is difficult to explain how such treatment acts but we do have some notion of the vast amount of mental stimulation, thought and cerebral association occurring as a direct result of visual activity, and the effect of this result on our thought, memory, mental organization and mental life. Reasoning from this conception, we can begin to visualize the effect of any distortion of this complicated hook-up on our nervous systems and the part it may play in producing functional nervous conditions and psychoneurosis. Conversely, we begin to have some comprehension of the effect of more or less minor psychic and functional maladjustments on ocular activity, the visual organ serving as a point of reference or fixation for the central disturbances.

Summary

Many obscure eye conditions have a functional element. This functional element is a causative factor in producing

nervous conditions and symptoms of eye strain.

Orthoptic functional exercises, along with other treatment, are therapeutic measures of much merit. Direct retinal and cerebral stimulation are produced along with an unmeasurable amount of psychic effect.

References

[1] Peter, Luther. Extra ocular muscles.
[2] Wells. The stereoscope in ophthalmology.
[3] de Schweinitz. Text quoting Verhoeff.
[4] Peckham, R. M. Modern treatment of binocular imbalances.
[5] Duane, Alexander. Subnormal accommodation, Arch. of Ophth., 1925, Nov.
[6] Wolfe, Otis. Orthoptic and fusion exercises, Trans. Amer. Acad. of Ophth. and Otolaryngol., 1927.
[7] Thomson. Quoted in "Treatise on glaucoma" by Colonel R. H. Elliot, London.
[8] Elliot, R. H. Treatise on glaucoma. Oxford Medical Publications, 1922.

THE TECHNIQUE OF PREPARING FOR CATARACT OPERATION

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Modification of the technique of the extracapsular cataract extraction to the increasingly popular intracapsular method has been made possible by improvements in the technique of preparatory measures. Akinesia of the lids, orbital anesthesia, canthotomy, suture of superior rectus muscle, and mechanical immobilization of the lids by improved specula are discussed. From the ophthalmic Department of the Royal Hungarian State Hospital at Gyula, Hungary.

That form of cataract operation which was practiced in the first two decades, partly even in the third decade of the twentieth century, is known as the Graefe-operation. If it be compared with the operation that is likely to become general, the Stanculeanu-Knapp-Török-Elschnig (SKTE)-operation, we may say that from the Graefe-operation nothing remains but the knife, as de Wecker held in his time (At the 7th International Congress, at Heidelberg, 1888) about the Daviel-operation that only a spoon remained from it. It is true the incision has been upwards ever since Graefe's time, yet it was not he who did it first. Today our aim is to remove the lens intracapsularly, and to do away with iridectomy. It is my intention to deal in this treatise with the technical preparation only, for the cataract operation. Still I must state that the technique of the preparation has undergone in the last two decades at least as much change as the operation itself. These changes came about because they were needed. With the progress in operative technique, the preparations had to be changed, the improvement in the technique of the preparations making alteration in the operation possible; thus the two developed side by side, each contributing to the perfection of the other. The technical preparation for the Graefe operation would be inadequate for an SKTE-operation. It would be impossible to get hold of the capsule at the bottom part of the lens, to luxate and extract the lens with its bottom edge upward, if the operator did not have complete control of the eye.

An improvement in preparation for for cataract operation has its main significance in rendering the general practice of the better method possible, but it is important also in relieving the surgeon of nervousness and anxiety.

In the present article I shall chiefly refer to those questions in the development or in the explanation of which I have had an active share, not referring to every detail of preparations, mentioning only those I am utilizing.

In describing the preparations I wish to follow exactly the proper order; namely, anesthesia, canthotomy, introduction of a suture into the superior rectus muscle, and the separation of

the eyelids. Of course, before a person suffering from a cataract is operated on, the eye is not the only organ that is examined. It is indispensable to examine the heart and the lungs, too, and if there be any luetic symptoms, the Wassermann test is made. If the patient's blood-pressure is found to be even slightly above normal, from 2 to 2.5 deciliters of blood are let the day preceding the operation. Our patients are mostly over 60 and 70 years old; our people are poor, and, unless driven by necessity, do not come to the hospital. Even when the cataract is already quite ripe on one eye, or over-ripe, if the sight of the other still enables them to do rough work, they can not be persuaded to go to a hospital. Therefore most of our patients come to us with one cataract over-ripe and the other unripe. In times gone by I used to operate on the hypermature cataract first; now, however, unless there is some contraindication, I operate on the immature one first.

The blood-pressure of these patients over 60 and 70 years of age is almost invariably high, normal blood-pressure being quite an exception among them. The letting of blood has an excellent effect upon our patients, since they withstand the excitement of the operation much better, and lie more quietly when it is over. Next the urine is examined and catharsis instituted.

Every patient's conjunctiva is thoroughly examined as to any bacterial flora by the Gram method. If this examination is negative and the conjunctiva sound and without discharge, then, according to Elschnig's counsel, for two days before operation ozycyanide drops (1:5000) are instilled. If the examination for bacteria is postive, oxycyanide of mercury, or argyrol (not optochin and rarely Betti-salve) are instilled, and a new bacteriologic examination is made and if same prove negative, the extraction is performed.

The drops are used in a different way than elsewhere. Since I have proven that solutions instilled into the lower fornix do not get into the inside of the upper fornix, the drops are now placed under the upper eyelid, whence they will be diffused all over the conjunctival-sac. For an antibactericidal effect the drops must get into the upper fornix. If the eye has a catarrh, but the bacteriologic examination proves repeatedly negative, then just before the operation the eye must be treated with a 1 percent solution of lapis (cuprum aluminatum.—Ed.). My method is to instil lapis into the anesthetized eye on

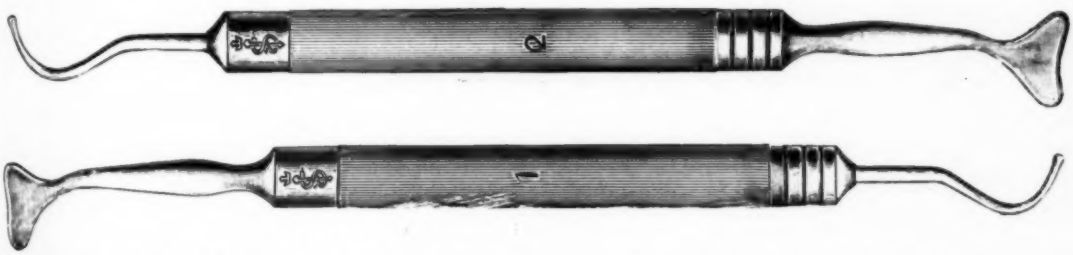

Fig. 1 (Oláh). The Oláh lid everter with one end curved and one end spatulate.

Note: This instrument is useful in examining the eyes of a group of patients as it enables one to do the examination without having to touch the eye with the hands. The figures enclosed show its actual use (Fig. 2). One has only to bear in mind that when the upper eyelid is already turned out partly then the curved end of the instrument must be pressed well between the two folds of the upper lid, while the handle is not rotated, but the instrument as a whole carried in the direction of the brow. One end of the lid-everter is spatulate, the opposite end being curved. In this way every eye is examined with a sterile instrument, and one does not carry infection from one patient to another. Frequent washing of the hands is unnecessary and much time saved when doing mass examinations. With infants and small children, by means of the spatulas, with a simple tipping, the conjunctival sac is exposed. (Oláh. Klin. M. f. Augenh., 1923, v. 70.) The Oláh-lid everter is made by Aktiengesellschaft für Feinmechanik (vormals Jetter und Scheerer), Tuttlingen, Germany. It may be ordered from any firm dealing in surgical instruments.

the operating table just before the operation. The lids are everted, the treatment performed without touching the lids with the hands. When the upper fornix is well exposed, the lower lid is pulled down with the instrument in the other hand and upon the conjunctiva of the upper is instilled a drop of 1 percent solution of lapis, immediately neutralized with a drop of sterile salt solution. To this end two Oláh lid everters are used.

Before the operation the nasolacrimal duct is irrigated, the punctum being rendered visible by instilling a drop of argyrol. Next comes the anesthesia of the eye. Common practice is to use a solution of five percent cocaine in a dose of five drops in all, at three minute intervals, in the lower fornix.

With this procedure the Graefe-operation could be performed quite irreproachably, but it has been found inadequate, since the introduction of the suture into the superior rectus muscle has become an essential part of the

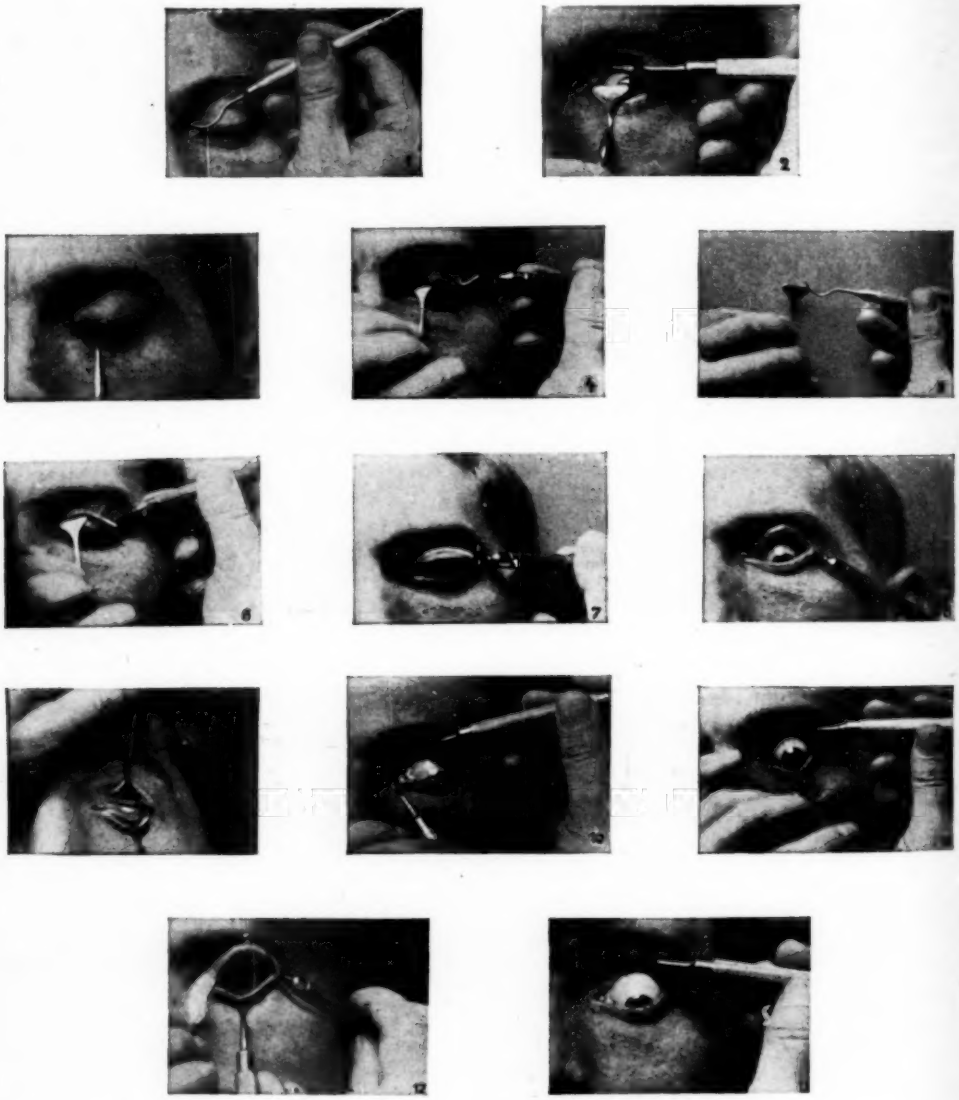

Fig. 2 (Oláh). Successive steps in turning the lids with the author's lid everters.

preparation for a cataract operation. So much so that Blaskovics, who first suggested the superior rectus suture for control of the eyeball, proposed giving an injection of novocaine into the tendon of the muscle to produce perfect anesthesia. Axenfeld did not disapprove of such an injection.

On the operating table I induce anesthesia in the following manner: The upper eyelid is slightly lifted with the Oláh lid everter and a single drop of five percent solution of cocaine is instilled beneath it. Although the patient has been prepared before coming into the surgery, still after the first drop of cocaine I once more wipe, with iodine-benzine, the outer corner of the eye and its vicinity, while the edge of the eyelid is rubbed with guaze twisted round a glass rod.

Next the outer corner of the eye is anesthetized with novocaine which is carried to the outer third of the lower eyelid, where the needle is to be inserted for the orbital anesthesia. Then another drop of cocaine and a drop of tonogen are given, followed by the orbital injection.

Orbital anesthesia has not become general yet although it is absolutely harmless. It is true it might evoke bleeding in the orbit, however, if we choose to proceed as is prescribed by several experts, mischief can hardly be done. The thin needle must be pushed forward by degrees, each time injecting a small quantity of novocaine; when deep enough, the piston of the syringe should be slightly withdrawn lest one should have punctured a vein. When withdrawing the needle, I keep a glass rod wrapped in gauze beside it, exerting pressure, after withdrawing the needle, in the direction of the roof of the orbit for a short time.

I began anesthetizing the skin of the outer corner of the eye when I started mechanically to immobilize the eyelids for it has been my invariable experience that in case of mechanical immobilization the outer corner of the eye is very sensitive. Therefore the outer corner of the eye is always anesthetized no matter whether I perform canthotomy or not.

The indications for canthotomy have been precisely stated repeatedly by Axenfeld who favored performing it in every case. This is quite reasonable, since he used neither mechanical immobilization nor akinesia. He executed canthotomy partly in place of akinesia. To my mind there is an absolute indication for it, if either the eye is too deep-seated, or the speculum lifts up the outer canthus so that we cannot get to the eyeball unless canthotomy is performed. There is a relative indication when we can get to the eyeball from the direction of the outer corner of the eye, yet we are threatened by the danger of the knife touching the skin on its path thereby possibly causing infection. Doubtless without the mechanical immobilization the absolute indication is much more frequent. On the other hand I must state that ever since I have performed orbital anesthesia, both absolute and relative indications recur in a decreasing number. If it can be seen in advance that there will be need for canthotomy, then, as soon as the skin of the outer canthus has been infiltrated, with narrow forceps I compress the skin of the outer corner of the eye where I intend doing the canthotomy. Thereby it is performed without bleeding in most cases. If the necessity for canthotomy only becomes evident after the insertion of the speculum, I see to it at once, but in the majority of cases, it can be told in advance. While compressing the corner of the eye, the orbital injection is given.

The placing of the thread in the tendon of the rectus superior causes no difficulties. Two drops of cocaine instilled in the proper fashion should suffice to render the introduction painless, if the orbital anesthesia is done beforehand. An injection of novocaine into the tendon is superfluous.

The separation of the lids may be done with the fingers, the best method being Vogt's procedure. The advantage is that the eyelids may be released whenever the patient's attitude makes it necessary or the vitreous humour appears. With an unruly patient, however, the superior rectus suture is more effective. On the other hand, if the vitreous

humour appears or prolapses it must be dealt with at once under the protection of the speculum or the Desmarres spoon, whatever type of lid retraction may be used.

If the vitreous humour has not yet prolapsed but is making its appearance, the lids are released in vain for the operation must be finished, so the lids must be opened again and the vitreous will appear as before. This question was dealt with by, Blaskovics, Liebermann, Lindner, Elschnig, and many others. Besides if the assistant is occupied with both hands about opening the lids, the suture of the superior rectus has to be handled by another assistant.

One part of the speculum (Snowden, Mellinger, etc.) is such that the ends may be pressed together to a certain extent after the opening, bringing pressure on the eyeball. The speculum is held by the assistant, but however quiet and reliable the patient, we are never sure that he is not going to make some trouble while the assistant's one hand is occupied with the speculum and the other with the stay suture.

Even when doing an iridectomy for glaucoma the patient may press out not only the lens but also a portion of the vitreous. This cannot always be prevented even by the suture of the superior rectus.

There is even a greater danger of this in extracting the lens as here the wound is much larger. When using the Desmarres spoon, both hands of the assistant are occupied with holding same, although an assistant with some experience will be able to take control of the stay suture as well. With the Desmarres spoon there is another hazard, as it can slip out from under the lid during operation. Elschnig admits the possibility of this right away. Ascher (Zur Verbesserung der Akinesie bei Staroperationen. Klin. M. f. Augenh., 1928, v. 81, p. 664) recommends that after placing the suture of the superior rectus we should give an injection of novocaine into the levator palpebræ superioris.

Castresana (Klin. M. f. Augenh., 1931, v. 86, p. 364) proposes that after making the wound and the iridectomy if any, the speculum be removed and the Desmarres spoon used in its stead, to allow the introduction of the capsule forceps. This procedure cannot be approved by any means, since the exchange of instruments for the retraction of the lids during the operation is highly dangerous.

Another kind of speculum immobilizes the eyelids mechanically. It was first introduced by Blaskovics, to whom we owe the idea of mechanical immobilization. In a technical way my immobilizer was more suitable (Klin. M. f. Augenh., 1925, v. 75, p. 418). On a deep-seated eye it was difficult to place this therefore I had it turned out in a form (Klin. M. f. Augenh., 1926, v. 77) adaptable to any eye. The first specimens of both models were made with fenestrated blades; since then the blades have been made solid. All those who have made modifications of my speculum have chosen the second model which I use only exceptionally for deep seated eyes.

The first modification was by Arruga who placed a tap for holding the stay suture on the upper blade, and set the spoon a little higher. At first sight the Oláh speculum and the Arruga modification appear the same.

The second alteration was effected by Guist to the end that the same instrument might be used, after proper adjustment, for either eye (Zeit. f. Augenh., 1930, v. 70, p. 392). Also in the upper handle there is a hole, through which he threads the superior rectus suture and ties it. This turns the eye downward and fixes it so that the patient is unable to make any movement of the eye whatever. The consequence is, that if the fixing suture is placed more medially than the center, according to Black, it is hard to avoid pricking into the caruncle; if again it is done more laterally, then the outer canthus might be in the way and even if canthotomy were done the Graefe knife may touch the skin, which is undesirable. For this reason I do not very much like the idea of fixation by means of the superior rectus suture and think that the original stay-suture is much more satisfactory.

But let us have a closer look at the

alterations. Before the operation Arruga ties the stay-suture to a tap, Guist threads it through a hole in the upper handle of the speculum, while Black (Amer. Jour. Ophth., 1930, Dec., p. 1066) puts it through a ring before the spoon and then ties it.

Before placing the knife upon the eyeball, we can judge if the eyeball is in the right position; whether there is danger of the knife touching the skin of the corner of the eye, or if we are likely to touch the caruncle when making the counterpuncture. By means of the fixation forceps and the superior rectus suture the eyeball is directed into the right position. Thus the suture is not only a fixing but also a directing medium. From this double rôle it follows that the fixing cannot extend over the whole course of the operation, but only to certain periods of it; in the intervals, according to the need, the position of the eyeball may even be changed.

There is, however, another factor on account of which the fixation of the stay-suture is not to be approved. Whenever the wound is made above, any instrument introduced into the anterior chamber must enter from above. For this reason the space above the wound and its height are extremely important. Upon this depends whether the introduction is easy or difficult, or whether it can be carried out from the top at all. The height of this space above the wound also depends upon many circumstances such as the shape of the bony orbit, the thickness of the soft parts, the pliability of the eyelids, and prominence of the eyeball.

However, the height of the space above the wound, for operative purposes, in itself has no decisive importance regarding the ease of introducing the instruments into the anterior chamber, since this is largely influenced by the distance between the upper handle of the speculum (or the Desmarres spoon) and the eyeball. The farther the upper handle is from the eyeball the more difficult it is to introduce an instrument (Axenfeld. Klin. M. f. Augenh., 1925, v. 75, p. 413).

If the distance between the upper handle of the speculum and the eyeball be the same, then, the higher the space above the wound the easier will be the access to it for the introduction of instruments. By fixing the suture to the upper handle of the speculum, the height of the space above the wound is materially diminished. This is the third reason why I disapprove of such fixation.

In removing the speculum, the lower lid is pulled down, the lower blade of the speculum is simply lifted out and the upper blade is removed from under the upper lid in a curved movement. This is easily done without touching the upper lid.

In the case of the Pretori-type speculum (Blaskovics, Oláh I, and II, and the altered forms of the latter) the two handles cannot be closed so easily since one handle is fixed to the lateral slide, and only the movable handle can be made to approach the fixed one.

In the Oláh and Arruga specula the lower handles may be brought toward the upper. In case of the Guist this may be done in the left eye, but when readjusted for the right eye, the upper handle is movable, whereas the lower remains fixed. Therefore it is somewhat hazardous to remove the Guist model from the eye, in fact to such an extent that Black even employs another suture in the upper lid to make the removal easier.

All of us who are deeply interested in this question are well aware that much improvement in the preparation for cataract operation may still be made.

References

[1] Blaskovics. Zeit. f. Augenh., 1892, v. 28, p. 285.
[2] ———. Klin. M. f. Augenh., 1914, v. 52, p. 504.
[3] Elschnig. Klin. M. f. Augenh., 1914, v. 52, p. 262.
[4] ———. Augenoperations-lehre, v. 1, p. 117.
[5] Axenfeld. Klin. M. f. Augenh., 1915, v. 54, p. 664.
[6] ———. Klin. M. f. Augenh., 1925, v. 53, p. 407.
[7] Kubik. Klin. M. f. Augenh., 1929, v. 82, p. 592.

[8] Ascher. Klin. M. f. Augenh., 1928, v. 81, p. 664.
[9] Oláh. Klin. M. f. Augenh., 1922, v. 69, p. 283.
[10] ———. Klin. M. f. Augenh., 1923, v. 70, p. 671.
[11] ———. Klin. M. f. Augenh., 1924, v. 73, p. 39.
[12] ———. Klin. M. f. Augenh., 1924, v. 73, p. 441.
[13] ———. Klin. M. f. Augenh., 1925, v. 75, p. 414.
[14] ———. Klin. M. f. Augenh., 1925, v. 75, p. 418.
[15] ———. Klin. M. f. Augenh., 1926, v. 77, p. 196.
[16] ———. Klin. M. f. Augenh., 1927, v. 79, p. 87.
[17] Guist. Zeit. f. Augenh., 1930, v. 70, p. 392.
[18] Black. Amer. Jour. Ophth., 1930, p. 1066.
[19] Castresana. Klin. M. f. Augenh., v. 86, p. 364.

A CONVENIENT DEVICE FOR USING ARTIFICIAL PUPILS OF DIFFERENT SIZES

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The device described provides an artificial pupil which may be held near the cornea and may be readily adjusted to ten different pupil sizes ranging from 0.5 mm. to 6.0 mm. in diameter. From the Research Laboratory of Physiological Optics, Wilmer Ophthalmological Institute, Johns Hopkins Medical School.

Two important uses for an artificial pupil may be noted—in a general examination and rating of eyes and in experimental work for various purposes of variation and control.

Low acuity may be due to several causes such as refractive defects, low coefficient of transmission of the media of the eye and defects in the sensorium. It would seem to be of great advantage to be able to know at the beginning of the examination of an eye with low acuity whether or not the first of these factors plays an important rôle in the reduced vision. It has long been known that an artificial pupil renders important service in this connection. However, an artificial pupil which fits into a spectacle or trial frame is too far removed from the natural pupil to give maximum service. Also we believe the apertures ordinarily used are too large to be of maximum benefit in forming the image. It is truly amazing what an aperture of optimum size and distance from the cornea will do in the way of rendering vision independent of defects in the refractive system.

Reduction in the size of the pupil may also exert a secondary effect on the clearness of the image. That is, in passing to the retina a certain percentage of light, variable from eye to eye, is scattered by internal reflections within the media. This scattered or unfocused light tends to blur or confuse the image and when present in sufficient amount causes the phenomenon known as veiling glare. By reducing the area of the surface of the cornea acted upon, the cross section of the beam throughout and the variety of angles at which the rays of light may strike the bounding surfaces of the media and the various reflecting particles and surfaces which are to be found in the media, a small pupil over and above the effect on the amount or intensity of light reaching the retina may serve to reduce the overlay of scattered light in the image. In any event the use of such an aperture before an eye that would be classed as emmetropic noticeably clears up vision under light of moderate and high intensities in spite of the reduction in the intensity of the useful light in the image. This may not be due entirely to an improvement in the focusing.

An interesting objective demonstration of the effect of size of pupil on clearness of image for lecture and classroom use can be made with a projectoscope, a lantern slide of a test letter such as the broken circle, and a plate or stop with an aperture of suitable size. An iris diaphragm is conveni-

ent for this purpose inasmuch as with it the effect of different amounts of reduction in size can be shown in series. Two cases may be made of the demonstration—when the focus is correct, or approximately so, and when the image is so badly blurred as to be entirely formless and unrecognizable. In the former case some improvement in the clearness of the image may be noticed and in the latter the image can be cleared up with even a moderate reduction in size of the lenticular aperture. A very good image can be obtained with a small aperture even when the focus is so poor that the effect is merely a fairly uniform patch of projected light.

The uses for an artificial pupil in the laboratory are too well known and too varied to merit noting here. It may be worth while to conjecture, however, that much of the work that has been done with an artificial pupil would have given quite different results had an artificial pupil which more closely approximated the position of the natural pupil been used. Some of it, we have found, can well afford to be repeated under better conditions of use of pupil.

The device to be described has the following features and advantages. (1) When in position the pupil is in almost direct contact with the cornea. (2) It is mounted in an eyepiece which can quickly and easily be fitted to the eye. (3) The eyepiece is mounted on a handle for convenience of placing and holding in front of the eye. (4) Ten sizes of pupil are provided ranging in breadth from 0.5 mm. to 6.0 mm. (5) A change in size can be quickly and conveniently made by rotating a dial, without removing the device from in front of the eye.

A picture of the device is given in figure 1. The eyepiece is in the form of a tube 26 mm. in diameter, 28 mm. long. The diaphragm forming the front of this eyepiece is made slightly concave so as to fit the anterior surface of the eye closely. At the center of this diaphragm is a circular aperture 12 mm. in diameter. Mounted in a vertical plane directly behind this aperture is the disc containing the ten artificial pupils. It turns about an axle which is parallel to the axis of the eyepiece. This axle is carried by a broad radial arm which is fixedly attached to the tube of the eyepiece by a narrow rim or collar. The tube of the eyepiece telescopes into a second section of tubing

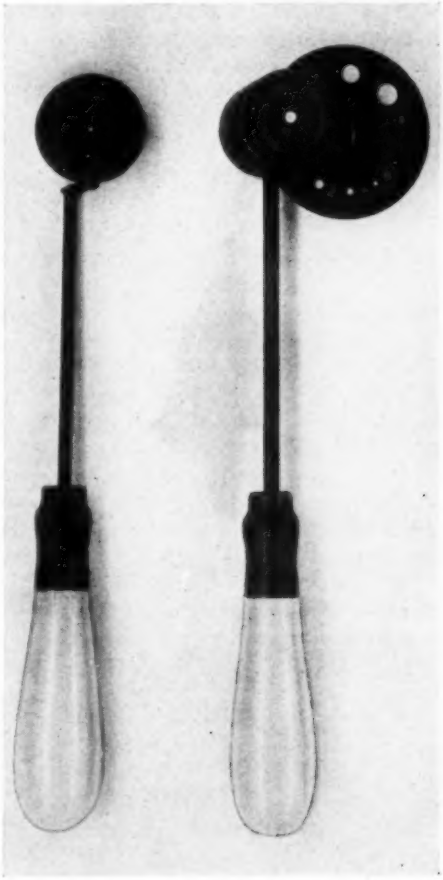

Fig. 1 (Ferree and Rand). Showing a device provided with a single artificial pupil and one provided with ten, ranging in breadth from 0.5 to 6 mm.

or broad collar 20 mm. long, to which the handle of the instrument is fastened. The disc can thus be rotated at will about the axis of the eyepiece. When in position for use, it is turned to the temporal side of the eye examined. In this position, there is no interference with the nose, brow or other parts of the face.

The ten pupils are arranged in the

form of a circle at a suitable distance from the margin of the disc. They are equally spaced and their centers are at a distance of 16.5 mm. from the center of the axle. Their diameters are respectively 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 5, and 6 mm. When in position in front of the eye, the center of each pupil coincides exactly with the center of the aperture in the diaphragm of the eyepiece. In order that each pupil shall automatically take this position in turn when the disc is rotated, ten stops are provided. These stops are constructed as follows. The back wall of the disc contains ten very small, shallow cups, suitably spaced on a circle with a radius of 20 mm., 3.5 mm. greater than the radius of the circle containing the centers of the ten pupils. In a mount at the center of the radial arm which carries the disc and in exact radial relation with the axis of rotation of the disc and the axis of the tube of the eyepiece, a small ball is sunk against a spring to give tension, at the proper level to engage the cups as they pass in rotation. The positioning of the ball and the spacing of the cups has, of course, to be made with great accuracy and precision, if the center of each pupil is to come to rest at the exact center of the aperture in the diaphragm of the eyepiece. For convenience of rotation the disc is provided with a milled edge, and to permit of smoothness and freedom of movement in turning, the circle containing the cups is grooved. With the provisions made for convenience and accuracy of adjustment, the pupils can be quickly and easily changed either by the patient or the examiner without removing the instrument from in front of the eye.

In order to eliminate reflections and scattered light, the inside of the tube is painted flat back. All the metal parts of the device are also suitably blackened. Near the farther end of the broad collar around the tube of the eyepiece, at a convenient distance from the eye, the handle of the instrument is inserted. This distance is made sufficiently great that when the handle is held vertically there is no interference with the cheek or the parts of the face. When wanted for use in a fixed position in a laboratory set-up, the handle can be detached and the tube be held in a suitable mounting as desired.

There is also shown in figure 1 a more simple device for the use of an artificial pupil of a selected fixed size. In this case the aperture of the size desired is cut at the center of the concave diaphragm of the eyepiece. In the device shown the aperture is 1 mm. in diameter. In a later paper results will be given pertaining to the optimum size of aperture both for emmetropic and ametropic eyes for different intensities of illumination.

The Wilmer Institute.

NOTES, CASES, INSTRUMENTS

HEADLAMP FOR BINOCULAR LOUPE

EMANUEL KRIMSKY, M.D.
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For the routine examination of the anterior segment of the eye the ophthalmologist depends on oblique illumination and a monocular or binocular loupe. While such an arrangement is useful in bringing into stereoscopic relief, foreign bodies or pathological deposits, the examiner may find it clumsy when attempting to hold sensitive lids open or when he needs the free use of his hands.

To simplify such manipulations it seemed that a lighting unit fastened to a head band would be more practical. The familiar binocular loupe manufactured by Zeiss has a central projecting rod for the attachment of a light carrier. My lighting attachment is different from that designed for this instrument in that it serves two distinct lighting purposes, either ordinary oblique focal illumination or slit illumination. It consists of a horizontal arm about one and one-half inches long which slips over and fastens at one end to the projecting rod of the loupe. At the other end is a revolving nut to which is attached a movable light carrier containing a six volt bulb and condensing lens. The light source may be either the house current regulated by a rheostat, or a battery.

This lighting attachment may be revolved about the central pivot through various angles to suit the convenience of the operator. While such a binocular loupe offers a maximum magnification of only 3 x it serves routine purposes well. I found that by fastening a plus 13 D. sph. lens to the front of the loupe there was a great increase in the magnifying power without producing any noticeable distortion.

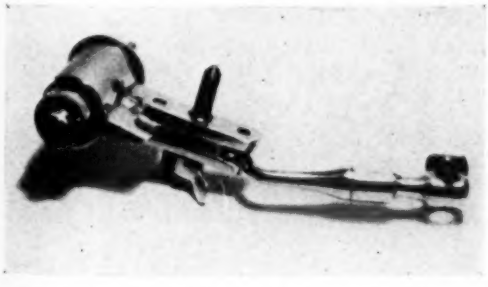

Fig. 1 (Krimsky). Arm attachment with light carrier.

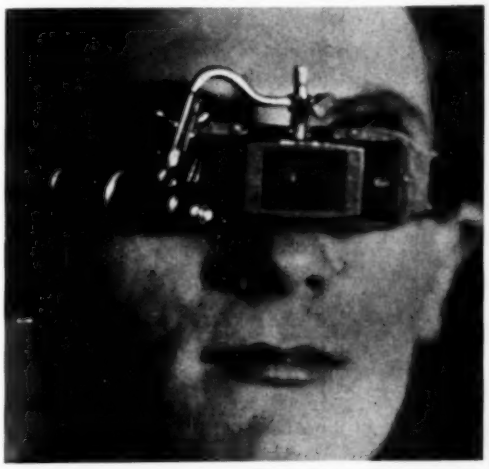

Fig. 2 (Krimsky). Loupe with arm and light carrier in place.

Fig. 3 (Krimsky). Loupe with plus 13 D.sph. lens attached.

By adjusting this light carrier a slit of crescentic shape can be produced due to the focusing of the filament of the bulb through the condensing lens. By employing a two and one-half volt

bulb a zig-zag slit may be produced at the same focal point of illumination, this point being less than one inch distance from the lens.

The light carrier used here is part of the Wappler lighting unit assembly designed for other purposes. It consists of a movable head which holds the condenser and a base for the insertion of the electric bulb.

In presenting this device I merely aim to demonstrate the convenience of operating with a suitable light source of desirable quality and intensity and rendering the operator's hands free at the same time.

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CONGENITAL ABSENCE OF PUNCTA AND CANALICULI

L. L. McCoy, M.D., F.A.C.S.
SEATTLE

The patient, C. E., a boy, aged five and one-half years, always healthy except for a questionable peritonsillar abscess at six months of age, was seen six months ago, August 24, 1931, because of marked tearing of both eyes which had persisted since birth. The only evidence of the condition having been inherited was a rather indefinite history of an uncle on the maternal side having had a similar but less severe lacrimation during infancy.

On examination, it was found that the eyes were perfectly normal except for the fact that there was no indication of a punctum on either lid, right or left eye except for a faint dimpling of the skin on the left lower lacrimal papilla which showed, on very careful scrutiny, a punctum faintly discernible through a membrane and a slight shadow on the right lower lid just under the conjunctiva extending from the lacrimal papilla to the inner termination of the lid suggestive of a canaliculus. No other malformations were discovered.

Under gas anesthesia the membrane over the left lower punctum was punctured and moderately enlarged with a Wilder dilator. Since then there has been no tearing of the left eye. It was also suggested that at a later date the right lower canaliculus be investigated under anesthesia. This was done October 15, 1931, but no sign of a canaliculus could be found by very careful exploration. No attempt at producing an artificial opening has been made so the tearing still persists.

The patient has been instructed how to wipe the eye properly to prevent the gradual production of ectropion. His mother says that since the left eye has been relieved of tearing, he seems to experience little annoyance from the overflow of tears from the right side. The question arises whether it is not possible that the sight in the right eye may become slowly impaired due to the constant blurring from the film of tears.

817 Summit avenue.

SOCIETY PROCEEDINGS

Edited by Dr. H. Rommel Hildreth

BROOKLYN OPHTHALMOLOGICAL SOCIETY

October 29, 1931

Dr. John M. Evans presiding

A study of the etiology of phlyctenulosis

Dr. Mortimer A. Lasky read a paper on this subject which will be published in this Journal.

Discussion. Dr. Ralph I. Lloyd stated that an interesting feature regarding phlyctenular disease was the change that had taken place in the number and type of cases during the past ten or fifteen years, there being few severe cases now. He believed that phlyctenulosis was an expression of a sensitized individual to the toxin of tuberculosis.

Dr. Robert M. Rogers called attention to the rapid increase in weight and increase in red cell count of many of the patients of Dr. Lasky's series, under tuberculin therapy.

Dr. Walter Moore thought that pediatricians were to be thanked for the lessening severity of these cases. These specialists were enlightening the public, as never before, on the proper care of children. We should not rely too much on the tuberculin test except when negative, but more on clinical and x-ray examinations. These patients would not show an active tuberculosis, but most of them did show some changes in the lung markings or more frequently in the tracheobronchial and hilus lymph nodes.

Dr. Clifford Place said that many of these cases had been cleared up quickly by hygienic means, calomel, elimination of carbohydrates, and the use of yellow oxide of mercury.

Dr. Henry Minsky felt that the condition was a result of poverty and slovenliness and that the change in the type of case was due to improved living conditions.

Dr. Mortimer Lasky, in closing, said that the intradermal tuberculin test had been used. He believed that phlyctenulosis would be proved to be an allergic tuberculin condition; some cases healed more quickly than others because some patients were not as sensitive as others to the toxins.

Bilateral orbital injury

Dr. John Bailey said the handle of an automobile door penetrated both orbits of a patient causing a collapse of the left eyeball and an exophthalmos of the right eye. The right disc was edematous and elevated. The patient was in a state of collapse. A foreign body, which measured 70 mm. in length and 25 mm. in breadth, was removed with some difficulty, under ether anesthesia. The left eyeball rapidly refilled, with restoration of its contour. The protrusion of the right eye receded. When the patient left the hospital, vision in each eye with a myopic correction was about normal.

Melanosarcoma of the choroid with temporary exophthalmos

Dr. John Bailey reported on a patient who had an absolute glaucoma with an exophthalmos of recent date. The exophthalmos completely disappeared four days after the patient came under observation. The eyeball was enucleated and found to contain a very malignant type of choroidal melanosarcoma near the posterior pole. The sclera was invaded. There was no gross evidence of orbital metastasis. The explanation offered for the exophthalmos was that there was a small retrobulbar metastasis containing thin-walled blood vessels which ruptured and the resulting hemorrhage was responsible for the protrusion of the eye. When the blood was absorbed, the exophthalmos receded.

Metastatic tenonitis

Dr. John Bailey said a patient developed a metastatic endophthalmia in the

course of a cerebrospinal meningitis epidemica. Later on, there appeared a bulging at the insertion of the medial and lateral recti muscles, apparently independent of the ophthalmia. Upon incision there was escape of a good deal of pus. The abscess cavities were continuous with Tenon's space and limited thereto, as proven by probing and exploratory incision.

Abscess of the brain with bilateral macular star

DR. JOHN BAILEY said this patient had had an infection of mouth and throat. About two months later, there was a slight blurring of both discs and some paresis of the conjugate movement to the left. There were also some motor disturbances of the left upper extremity and chest. There appeared shortly afterwards a bilateral edema of the nerve head with an elevation of three diopters. The patient left the hospital and two months later, was re-admitted with both discs elevated six diopters and a stellate figure in each macular region. Vision was greatly impaired. Ventriculography revealed a mass pushing the left ventricle to the left and also a depression of the posterior horn. Operation disclosed a large abscess involving the left parietal and occipital lobes. The papilledema slowly disappeared as did also the star-shaped figure in the macula, with resulting degenerative changes in the latter region. The child was now practically blind. The nerve heads showed secondary optic atrophy.

GEORGE FREIMAN,
Associate secretary.

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY

November 17, 1931

DR. S. JUDD BEACH presiding

Streptothricosis of the canaliculi

DR. JAMES J. REGAN presented a housewife, sixty-one years of age, whose chief complaint was epiphora, left eye, which had existed for one year. He stated that the chief clinical characteristics were a very slight induration about the lower canaliculus with overlying skin only moderately reddened. The lower punctum was dilated and filled with what appeared to be granulation tissue, which bled easily with the passing of a small probe which was accomplished without trauma. It formed the apex of a cone-shaped swelling with the surrounding lid margin. Upon pressure over the canaliculus, a small amount of secretion resembling skimmed milk was expressed. The upper punctum and canaliculus presented a similar picture.

Dr. F. H. Verhoeff, who made the diagnosis, seemed to be able to do so upon the clinical appearance, and Dr. Regan thought the case of interest to members of the society since many cases of streptothricosis of the canaliculi were treated as simple chronic dacryocystitis.

Streptothrix concretions were recovered from both the upper and lower canaliculi, and a culture and slides were shown by Dr. Merrill King. Dr. Regan stated that, according to Dr. Verhoeff, the involvement of both canaliculi rarely occurred.

Sarcoma of iris and its removal by iridectomy

DR. E. B. DUNPHY presented a woman, forty-eight years old, who came into the hospital three months ago complaining of frontal headache. In the course of refraction, it was noticed that she had a very dark brown pigmented nodule on the iris, lower nasal quadrant. It was elevated, about the size of a large black-headed pin, and interfered with the motility of the iris. The case was diagnosed as sarcoma of the iris. When the pupil was contracted by pilocarpine the iris angle was free. There was no evidence of extension, as far as could be made out, into the iris angle. It was, therefore, thought better to do an iridectomy rather than sacrifice the whole eye. The ordinary keratome incision was made below and in, a little to one side of the tumor which happened to be

situated about the middle of the iris. Then with iris forceps, the sphincter was held, the iris extracted, and an iridectomy done. The patient now had 20/30 vision. She still had her headaches. There was no history of tumor in the family.

Dr. Dunphy stated that the point to be brought out in this case was the interference with the motility of the iris in cases of suspected malignant tumors. It was probably a sarcoma if contraction of the pupil was interfered with in the segment where the tumor was noted.

Asteroid hyalitis and retinitis pigmentosa

Dr. Virgil G. Casten showed a forty-three year old woman, mother of ten children, who came in a short time ago complaining of poor vision for the past one and one-half years. Examination showed vision 20/40 right eye, 20/200 left. There were marked snowball vitreous opacities of both eyes, with marked pigmentary changes in the fundi. The peripheries of the fundi were normal, also immediately around the discs; but at the mid-zones, there were marked bone-corpuscle shaped patches of pigment. The veins were of normal caliber and, in many places, completely encircled by deposits of pigment. The arteries were extremely small and seemed to be almost obliterated in places. The left optic nervehead looked pale. The field could not be relied upon entirely, as the patient's cooperation and knowledge of English was poor; but showed marked concentric constriction in the right eye, and only an eight degree central field in the left. The Wassermann was repeatedly negative. The blood calcium was 10.3 mgs.; blood cholesterol was 230 mgs.; blood sugar was 90 mgs. Complete medical examination was negative.

Dr. Casten stated that Benson first described this type of vitreous opacity in 1894. Drs. Verhoeff, Holloway, and Fry had shown that these opacities were composed of calcium carbonate, calcium stearate, palmate, and some lipoids. In the cases looked up, one showed an old tubercular chorioretinitis, several showed old cases of chorioiditis, and several seemed to be associated with angiosclerosis. No definite reason was known for the causation of the asteroid hyalitis opacities.

Discussion. Dr. Rowland remarked that he was interested in asteroid hyalitis cases because he had five or six patients with this condition. The ages of these patients were: 84 years with involvement of both eyes; 75 years with involvement of one eye and questionable involvement of the other; 64 years with involvement of one eye only. Of another case, he could get no information whatever. Dr. Rowland asked what, in the opinion of the surgeons present, would be the outcome of a case in which a cataract had been removed, and the fundus found afterwards to show asteroid bodies? He also asked if it would be considered good judgment to operate on a patient who showed asteroid hyalitis in one eye and cataract in the other. This summer, Dr. Rowland stated, he had operated on a man 75 years of age, whose physical condition had been found satisfactory by his physician, and whose right fundus showed very marked asteroid hyalitis, not only single white round bodies, but great clouds of them. A capsulotomy and combined operation was done. The entire corneal section was done under the conjunctiva. It was a clean operation. On the fourth day after operation, the patient showed a white exudate in the anterior chamber. This did not act like an ordinary infection, but showed hypopyon, not of the ordinary type. After a week, this condition cleared up. The patient then developed hypertension which continued over a period of about two weeks. He began to show blood in the anterior chamber, the bleeding coming from a point on the nasal side of the iris, about halfway across, which persisted as a bleeding point for two weeks. At present, the tension was not very high, and the eye had cleared up very well, but the

pupil was drawn up. Dr. Rowland wondered if the bleeding in the eye was from a tubercle. He stated that there was no evidence otherwise of tuberculosis in the eye.

Dr. Verhoeff stated that the patient was old enough to have arteriosclerosis, and that that would account for the bleeding. He also stated that he had operated on two cases of asteroid hyalitis and expected to lose vitreous, but did not. One patient was only about forty years old. He had asteroid hyalitis in one eye, but that was not known until after the operation. As he was too young for an intracapsular extraction, Dr. Verhoeff did a discission, and a linear extraction. The patient obtained 20/20 vision immediately following the operation, but shortly after complained that his vision was getting worse. Tests showed vision was then 20/70. Fundus examination showed a cystoid condition of the macula. Later, Dr. Verhoeff operated on the other eye. He stated that when tests were made subsequent to the second operation, vision was found to be 20/30 in the eye first operated on, and expressed an opinion that it would improve to 20/20. Dr. Verhoeff also stated that he did not know why this edema occurred in the first eye, but said that occasionally cataract cases showed edema, as well as a hole in the macula. He said that he did not know whether the asteroid hyalitis had anything to do with it or not, but stated that when a cortical cataract occurred in one so young, there must have been something physically wrong.

Note on tendon tucker and tucking

Dr. W. Holbrook Lowell said that in 1929 an article by him was published in the American Journal of Ophthalmology entitled "Measured correction of squint by combined technique". Since then he had found a slight change advisable in making the measurements before operating. It had been observed, because of the marked cicatricial contraction following the cuts in the internal rectus, that greater shortening of the external rectus was needed, even to slight overcorrection after the operation, which, of course, would not be wise if a tenotomy and advancement were done. Therefore, he stated, he was now dividing the number of arc degrees of convergence by three instead of five. This had resulted in much less restitution and a more nearly perfect result from a surgical standpoint, although the previous results were cosmetically good and satisfactory to the patient. Dr. Lowell said that it was somewhat alarming to find, the day after operation, that the eye diverged considerably, but by the fourth or fifth day, the cicatricial contraction and healing of the cut internal rectus brought the eye straight, there being almost no convergence with the cover test.

Dr. Lowell stated that he used a modified Bishop tucker. The blades had been made solid, with two notches below, and a calibrated sliding scale with a set screw, so that the tucker might be set for the desired amount of tucking before the operation. Then, according to Dr. Lowell, there was no measuring during the operation, or straining to look at the millimeter scale as the tuck was made. He said he found it very trying to measure with a rule, or to endeavor to get just the right number of millimeters during the operation. With the stop which he had added to the Bishop tucker, the measuring was done before the operation, the instrument was set, and the operation went on without any lost time and without discomfort.

Spasm of accommodation

Dr. Paul Chandler cited the case of a patient whom he first saw four years ago. At that time she complained of poor vision in school. Vision, in each eye, was 6/9, and refraction showed that she took a —.50 D.sph. with a —.50 cyl. in each eye. She was given homatropine and found to be farsighted, requiring a +.25 D.sph. with a +.25 cyl. each eye. She was given homatropine to use at home. She used it in varying amounts at various times. Dr. Chandler said that each time she

used it the vision would improve for distance, but would become poor again as she discontinued.

During the next four years, she was examined four or five times, and on each occasion, showed essentially the same condition. The last examination, on October 7, showed her vision in the right eye was barely 6/12— without glass, and 6/9— in the left eye. No fogging would make her relax accommodation. For this purpose, she was, at one time, given a +1.50 D.sph. without success. Her right eye would not relax, and she would have to hold her head down close to reading material in order to see. If she did not use homatropine, she could not see for distance, and if she used drops, her near vision was blurred. Dr. Chandler stated that he had never given her a glass other than a +1.50 D.sph. for reading. Four years had gone by, he stated, and she was just exactly the same as when first examined.

Discussion. Dr. Pascal said that the use of a low power prism would frequently break up a spasm.

Dr. Verhoeff stated that he didn't think the patient had a spasm. He thought it might be purely optical. He asked if Dr. Chandler had had the patient look through a hole the size of the pupil to see if the refraction would be the same. He stated there would be a difference between a dilated and contracted pupil. It seemed, he said, remarkable that the patient had had this condition all these years. He suggested trying a minus glass.

Dr. Rowland asked if the patient had any unerupted molars.

Dr. Chandler replied that he didn't know. He also said that when the patient read, her eyes gave her a certain amount of discomfort. She did a minimum amount of reading comfortably. He stated that the patient would wear any glass he gave her.

Demonstration of photoscope

Dr. Joseph I. Pascal (by invitation) demonstrated the photoscope, and read a paper on its use in retinoscopy which will be published in a later number of this Journal.

Concerning magnetic intraocular foreign bodies and their removal

Dr. F. H. Verhoeff read a paper on this subject which will be published in this Journal.

James J. Regan,
Recorder.

COLORADO OPHTHALMOLOGICAL SOCIETY

November 21, 1931

Dr. Wm. C. Finnoff presiding

Vitreous opacities secondary to hemorrhage

Dr. D. A. Strickler presented S. B., a thirty-seven year old man, whose right eye had been injured on November 20, 1930, by being struck by a piece of lumber causing a massive hemorrhage into the vitreous. The man had been cared for by the oculist for the employer; such a bad prognosis had been given that full compensation for the eye was paid. The patient had first come under Dr. Strickler's care on January 11, 1931, at which time no fundus reflex could be obtained. Transillumination showed a clear pupil, however. With the corneal microscope it was seen that the vitreous was filled with blood and that there were many clubbed opacities in the anterior and posterior cortex of the lens, more marked at the corona.

The patient was next seen on August 10, 1931, at which time the vision was about 20/100, varying with movement of the eyeball. On August 28 the vision was 20/80 uncorrected, and 20/40 with a —0.50 D.sph. The vision had remained stationary since then and there was still no fundus reflex with an undilated pupil. Even with a dilated pupil, the fundus reflex was poor and details were not discernible, but by transillumination a mass of floating material could be seen. The treatment had consisted of ledum palustre internally since first seen. On September 15, drops of 3 percent dionin in 1 to 1500 mercuric cyanide had been used.

Dr. Strickler presented this case be-

cause of the unusual amount of vision in an eye with such a very poor fundus reflex, and to illustrate that one should not give a hopeless prognosis too quickly in a case of massive hemorrhage into the vitreous.

Discussion. Dr. Wm. M. Bane said that it was interesting to see a case in which 20/40 vision was obtainable even though the fundus could not be seen. Dr. Bane also warned against too hasty recommendation of final settlement in compensation cases.

Dr. Wm. H. Crisp commented upon the difficulty in deciding in some cases as to when a final settlement should be made. Dr. Crisp recited a case of a man of fifty years who had had such a marked corneal opacity from an injury that he had received a full award and yet ten years later he had 25 percent vision. The clearing of the cornea at that age had been an added interesting feature.

Injury involving superior oblique

Dr. Wm. H. Crisp presented a woman of about thirty-eight years, who, in an automobile accident three weeks previously, had received a deep puncture wound over the region of the pulley of the right superior oblique muscle, as well as other facial injuries. After the primary severe ecchymosis and swelling had subsided, she complained of diplopia, the image seen by the right eye standing, in the primary position, below and slightly to the left of that seen by the left eye. There was no tilting of the lower image. Two weeks after the injury the right eye had manifestly stood higher than the left whether the eyes were directed straight ahead, up, or down, but at the time of presentation there was appreciable improvement. The patient had been wearing dark tinted glasses outdoors, with paper pasted behind the right lens.

Discussion. Dr. Edward Jackson said that these traumatic muscle paralyses usually recovered completely, and that he would expect such a result in this case unless the pulley had been damaged.

Dr. D. G. Monaghan said that he thought the general shock to the nervous system was often a definite factor in these paralyses, and that they were not always due to the local injury alone. Dr. Monaghan also expressed the belief that foci of infection in some cases had a deleterious influence on the recovery.

Dr. Wm. M. Bane recalled a case in which the internal rectus had been so badly injured that there was a marked divergence and yet six months later the recovery was complete. Dr. Bane said that it was his custom to chart diplopia fields at intervals in such cases in order to watch the progress.

Dr. E. B. Swerdfeger mentioned a case that he had seen in which a foreign body had done considerable damage to the muscles as it went into the orbit and yet the eye regained full motion.

Advanced pterygium (re-presentation)

Dr. William C. Finnoff presented Mrs. W. H. S., aged fifty-seven years, who had been formerly shown before the Society on November 15, 1930, for an extensive fleshy recurrent pterygium. It had been suggested then that the thermophore be used in the treatment before operation was attempted. For purposes of treatment the tumor was considered to be divided into three parts and the thermophore was used alternately on one of the three parts on an average of once in three weeks, at 138°F., for the past year. The day following an application one could see edema of the area over which the thermophore tip had been applied. On the third day extensive hemorrhages would occur in the surrounding tissue and with the slitlamp the blood in the vessel walls was seen to be coagulated. The reaction lasted on an average of ten days.

With continued treatment the pterygium had become remarkably thinner and the blood vessels had diminished decidedly in number and size. What formerly seemed to be a hopeless case had shown great improvement in appearance, and much improvement in vision had resulted.

Discussion. Dr. Wm. H. Crisp congratulated Dr. Finnoff not only on the

result, but on keeping the confidence of the patient for repeated treatments.

Meningeal (?) cyst

Dr. Merritt B. Hook presented Mrs. J. A., twenty-five years of age, who had been to the Clinic of the University of Colorado Medical School complaining of a tumor mass under the right upper lid at the medial canthus. The mass had been present as long as she could remember. She had had rather frequent attacks of pain on the right side of the head, which were followed by enlargement of the tumor mass. The mass could be made to lessen markedly in size by the use of hot compresses or pressure. The tumor was soft, round, translucent, and fluctuant. An attempt had been made to remove the fluid with a large needle, but the contents would not flow into the syringe. The lacrimal passages were patent. Vision was 20/20+, each eye, with a negligible correction. Dr. Hook was planning to inject the mass with sodium iodide and take an x-ray picture.

Discussion. Dr. Wm. H. Crisp suggested leaving the mass alone.

Dr. F. R. Spencer said the location and appearance would point to the diagnosis of a mucocele of the ethmoid labyrinth or of the frontal sinus. He mentioned that it might be a dermoid.

Dr. M. E. Marcove said he had seen a case of a dermoid in this area and that in attempt at removal the surgeon had cut the superior oblique muscle.

Dr. Wm. C. Finnoff believed the case was one of meningocele, even though the patient had no headache on pressure on the mass. He remarked that this might be an orbital cyst and in an attempt to remove it one might be embarrassed in finding "no end" to it. He suggested another attempt at removal and analysis of the contents, and an x-ray picture after lipiodol or sodium iodide injection.

Glaucoma simplex of one eye, and macular degeneration of the other

Dr. Wm. C. Finnoff presented S. B. F., male, aged sixty-four years, colored, who had been first seen February 21, 1929, with a massive yellowish exudate in the macular region of the left eye. The vision of this eye had been nil. In the right eye there had been a simple noninflammatory glaucoma; tension 33 mm. Hg. (Schiøtz), with marked contraction of the visual fields and enlargement of the blind spot. An Elliot corneal trephining was done on April 30, 1929, with a lowering of the tension. Since that time the fields of vision had remained unchanged and the tension had equalled 18 mm. The exudate in the left eye had shown marked change, with the formation of massive collections of cholesterin crystals and proliferation of pigment.

Discussion. Dr. Wm. H. Crisp said that he had not known that the tension could be reduced so much and for so long a time by massage. Dr. Crisp believed that the outlook for a glaucoma patient was now not nearly as bad as we formerly considered it. He preferred the iridencleisis operation, and urged surgical intervention early rather than late if the tension was not easily controlled by miotics.

Paramacular degeneration

Dr. E. E. McKeown presented Mr. W. F. G., who complained of loss of sight in the left eye for some 12 years. He gave a history of having a broken nose in 1919. He had dengue fever in 1924 and malaria in 1926. There was no venereal history.

Examination of the eye showed iris and cornea to be normal, anterior chamber of normal depth, no increased tension. The vitreous was clear, and the fundus had a large white spot on the temporal side of the disc. This extended to about 6 mm. past the macula. Apparently there was no swelling or elevation. The vessels were very small through this area.

Discussion. Dr. Wm. M. Bane said the area gave him the impression of being due to an old embolus.

False macula

Dr. David A. Strickler reported the case of W. E. S., aged forty years, who had been first seen September 28, 1931. She gave a history that the left eye had turned in as long as she could remem-

ber. At the age of nine years stereoscopic exercises had been prescribed for her.

At the time of her present examination the left eye was 10 to 20 degrees convergent. The patient could fix with either eye under cover test. There was no diplopia. The fundi were normal. The vision O.D. with a +3.50 D.sph. was 20/20; the vision O.S. with +3.50 D.sph. = +.75 cyl. ax. 180° was 20/200. The squint was the same with or without glasses. With the stereoscope she could put the bird in the cage, but gave poor perspective tests. With the Maddox rods she showed a right hyperphoria of 1 to 1.5 degrees with an "exophoria" of 8 to 20 degrees. The hyperphoria at 13 inches was 2 degrees and the exophoria 8 to 15 degrees. Under treatment with high frequency the vision O.S. had improved to 20/80.

Dr. Strickler presented the case because of the unexpected exophoria in the presence of an evident convergent squint. He thought the case was one of false macula and gave a résumé of the literature on the subject.

Discussion. Dr. Wm. M. Bane recalled having seen such a case at the University of Colorado Clinic.

Dr. Edward Jackson said that he explained such cases not on the presence of a functionally new macula, but rather on the basis of false coordination or unusual association.

Dr. Wm. H. Crisp suggested that in such cases that if there was an area of increased function it was probably cerebral rather than retinal.

Ralph W. Danielson,
Secretary.

ROYAL SOCIETY OF MEDICINE, LONDON

Section of Ophthalmology

December 11, 1931

Mr. Elmore Brewerton, president

Choroidal carcinoma

Mr. O. Gayner Morgan showed a woman aged thirty-six years, who had had carcinoma of the breast. Advice had been sought late and so the condition had to be treated with radium. Three months ago there was failure of vision in the one eye, and now there was a central detachment of the retina, appearing solid. There were no new vessels on the surface. He regarded this as a metastatic tumor from the breast carcinoma.

Discussion. Sir Richard Cruise advised removal of the eye.

Retinitis punctata albescens

Mr. Cole Marshall said that in most of the cases of the kind reported vision did not diminish; that was a point made by Nettleship in connection with three cases which that authority showed in 1885. The alarming thing about the present case was that since last February the vision had gone from 6/12 to less than 6/60, and at the macula there was a fine retinitis. He was examined by the Civil Service Commission. Following the removal of many bad teeth the vision improved. The exhibitor therefore thought that two conditions were present: retinitis punctata, and a fine retinitis due to some septic condition.

Nevoid condition and telangiectasis

Mr. Cargill showed a patient. The small telangiectases which were found on the point of the eye had been present since birth. The left eye was myopic without good vision. An x-ray would be taken, and the eye watched for the development of glaucoma.

Discussion. Mr. Ormerod thought this case fell into the group which Ballantyne wrote about, a nevoid condition of the skin associated with glaucoma or buphthalmos, or sometimes with defect in the visual fields. More work was required on these cases.

Punctate keratitis

Mr. Foster showed a man aged twenty-three years. Seven weeks ago when riding a bicycle, the eye became sore and shortly afterwards punctate keratitis developed. The case was sent into the hospital diagnosed as iridocyclitis, as the deeper changes were mistaken for precipitates. Examination with the

slitlamp proved them to be in the cornea. The only thing near to this diagnosis he could suggest was phlyctenular disease.

Glaucoma capsulo-cuticulare

MR. CHARLES GOULDEN exhibited a case. So far as he knew this was the first case of the condition published in this country. The patient, a woman, came to the hospital in July, 1929, complaining of a defect in the vision of her right eye; its tension was normal. Later in the year she was found to have a posterior cortical cataract and a peculiar degeneration of the anterior capsule of the lens. He saw her next two months ago, when she had marked glaucoma in the right eye for which he did a complete iridectomy. It was a condition brought about by degeneration of the layer of Bergen, particles of it becoming impacted in the spaces of Fontana. It was one of the causes of glaucoma in the anterior chamber.

Capsular changes in the lens

MR. GOULDEN showed a man the vision of whose right eye had been failing for four years; the left eye was not so greatly changed. He had been working at a grill as a chef for 47 years, and the man himself considered that both eyes had been equally exposed to the heat of the fire. In the right eye there were a good deal of pale corneal precipitates, with endothelial bedewing. With the pupil dilated it could be seen that the zonular layer of the anterior lens capsule had become detached and protruded as a folded transparent membrane into the anterior chamber, almost touching the cornea. A considerable amount of uveal pigment was seen on the anterior lens capsule.

Disciform degeneration of the macula

MR. SAVIN showed a man aged sixty-five years, whose vision failed in the early part of the present year. He had syphilis in 1914, but the Wassermann test was now negative. He had septic teeth which were under treatment. He also had emphysema, eczema of the groins and onychogryphosis. The blood-pressure was 165/130; urine normal. A circular area of edema was visible at the right macula, almost suggesting a detachment.

Retinitis pigmentosa

MR. SAVIN showed a girl aged fourteen years, with degeneration of the retina, nystagmus, and convergent strabismus as well as the retinitis pigmentosa. In addition to the ocular defects she had idiopathic dilatation of the colon (Hirschsprung's disease). Her brother had a similar eye condition, but his colon was normal. This girl had not been able to pass a stool without an enema for six years. He believed the ultimate prognosis was very bad. Usually the cases of this kind ended by perforation of the colon and death from peritonitis. He raised the question of some possible connection between the Hirschsprung's disease and retinitis pigmentosa. The former was probably due to some lesion in Aurbach's plexus.

Injury to superior oblique muscle

MR. SORSBY showed a boy twenty years of age who had been injured by the blade of an open penknife in the upper part of the orbit. Afterwards he had double vision. The superficial wound healed in two or three days, but he was left with diplopia.

Discussion. MR. P. G. DOYNE said that if the condition did not get better in a reasonable time he would recommend tenotomising the inferior oblique. That operation answered very well in cases of torticollis.

MR. T. HARRISON BUTLER said he did not think the inferior oblique antagonized the superior oblique; in this case it would be necessary to deal with other muscles as well.

MR. F. J. CUNNINGHAM advised waiting a considerable time before doing anything, and quoted a case which eventually got well without operation.

DR. MADDOX said he had had two or three cases of traumatic paralysis of the inferior oblique treated successful-

ly by recession of the inferior rectus of the other eye. He had had one such case which was not traumatic.

(Reported by H. Dickinson.)

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

January 18, 1932

Dr. Hilliard Wood presiding

Retinitis pigmentosa with glaucoma and cataract

Dr. J. L. Bryan reported the case of Mrs. R. F. T., aged forty-four years, who complained of intense pain in the left eye beginning the previous night. The patient stated that she had always had weak eyes, the vision especially impaired in dim light. One year previously there had been noticeable loss of vision, and three months later there began intermittent attacks of pain radiating to the left eye, lasting three weeks.

The patient's parents were not related, but as far back as the paternal lineage was traceable there had been blood relationship between parents, the connection being that of first cousins. The patient's father had complained of poor vision which was worse at night. Two sisters and two brothers suffered as the father. All of the patient's cousins on the paternal side had poor vision. Of seven children the patient reported one daughter who had weak eyes.

Examination revealed bulbar congestion, hazy corneæ, pupils dilated, the left being wider than the right. There was a central lens opacity on the right side; a diffuse opacity of the lens on the left side. The vision was reduced to light perception. The intraocular tension measured in the right eye 110 mm. and in the left eye 120 mm. (McLean).

A small portion of the temporal half of the right fundus which could be seen with the ophthalmoscope presented a typical picture of retinitis pigmentosa.

H. C. Smith,
Secretary-Treasurer.

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

January 12, 1932

Dr. J. W. Ramsay presiding

Contusion of globe with secondary glaucoma

Dr. Phil M. Lewis reported the case of a white boy, six years old, who was struck in the left eye on September 27, 1931, with a heavy rubber band. He was seen within thirty minutes of the accident. The cornea was abraded and the anterior chamber filled with blood. Atropine one percent, bichloride ointment and a dressing were applied and the patient sent to bed. The following day the blood had absorbed and the fundus appeared normal. No more atropine was used and he was kept in bed. The second day he had severe pain and examination showed the anterior chamber again filled with blood and the tension quite high to palpation. Pilocarpine two percent and hot compresses were used every two hours. When seen the next morning the anterior chamber was clear, the pain had disappeared and tension was 32 mm. (Schiøtz). The vitreous was very hazy with blood and the fundus poorly seen. The use of dionine was added to the treatment. Six days after the injury the eye had about returned to normal. A normal fundus could be clearly seen. Two weeks later the eye was normal and the vision 20/20.

Dacryocystitis

Dr. A. C. Lewis presented the case of F. P., a boy of eleven years. An abscess had appeared over the left lacrimal region early last year, following nasal infection, and suppurating cervical adenitis. The lacrimal abscess had been incised, and had drained most of the time since. When first seen by Dr. Lewis, there was a soft granular mass covered with thin skin, surrounded by a large area of inflammation.

Two days later, November 30, 1931, a large external opening was made and all granulations curetted out, with the

intention of removing the sac at a later date. A probe went directly into the nose through a bony dehiscence; there was a complicating suppurative ethmoiditis. The x-ray and rhinology reports were practically negative.

On December 13, 1931, the tear sac was extirpated and the wound closed as well as possible, leaving a small gauze wick for drainage, but a small fistula continued to drain the tears. After slitting both puncta and widely dilating the canaliculi, the electric needle was employed to destroy their mucous linings. Silk sutures were then used to obliterate the canaliculi. A week later the patient was discharged in good condition with the lacrimal fistula closed.

Iritis of dental origin

DR. A. C. LEWIS reported the case of Mrs. J. W. C., seen November 3, 1931, with a red and painful left eye of two days' duration. There was chemosis on the temporal side but no abnormality of pupil and iris. An hypertrophic left middle turbinate pressed against the lateral nasal wall; an infraction relieved the pressure and two days later the eye was improved. Dental examination revealed four bad teeth, two of which were removed with further improvement of the eye. On November 8, there was beginning iritis, which was treated with atropine, dionine and hot packs. In two days there was no inflammation. Four relapses occurred, each disappearing with the removal of a tooth. One molar root left a large opening in the right antrum after curetting the necrotic bone.

RALPH O. RYCHENER,
Secretary.

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THE PRIMARY OPTIC CENTERS IN EVOLUTION

In the evolution of a species, new structures were slowly developed and old ones slowly discarded. The presence and arrangement of vestigial structures may furnish extremely important evidence as to an ancestral relationship between two widely different families of the animal kingdom, even though at the present time the two lines of descent have no great apparent resemblance to each other.

Thus, in the fascinating attempt to trace man's genealogy from his primordial ancestors, certain investigators have concluded that a queer little animal found on the islands of Borneo and Java, namely the spectral tarsier, is perhaps the last surviving representative of a common ancestry from which are derived the lemurs, the monkeys, and man; while one extremely venturesome investigator (F. Wood Jones) has even gone so far as to exclude all the apes and monkeys from man's genealogical tree and to trace man directly from a close relative of the spectral tarsier.

Man differs above all from other animals, including his cousins the monkeys, in the ability to think and to profit from experience. Closely interwoven with the acquisition of experience and the ability to reason from cause to effect, and ultimately from effect to cause, is that capacity for coordination between hand and eye, in which man so infinitely surpasses all his ancestors and relations.

The evolution of intelligence is of course as old as the evolution of life itself. An extremely interesting series of evolutionary changes created the brain of a mammal out of that of a primitive reptile, and these changes included a radical rearrangement of optical centers and of their connections with muscular activity. In the development of the complicated cerebral cortex, the organ of vision obtained a cortical representation in addition to those primary centers which had been responsible for visual relationships in the lower vertebrates.

The work of Brouwer, Minkowski, Wollard, and others with regard to the development of the macula and the projection of the retina in the brain is intimately associated with the bold although sometimes debatable conclusions of Elliot Smith and his followers as to man's descent in common with the apes and monkeys, the tarsioidea, and the lemuroidea. To the intricate detail of this discussion Le Gros Clark (British Journal of Ophthalmology, volume 16, page 264) contributes a morphological study of the lateral geniculate body. The ventral nucleus of the lateral geniculate body does not give rise to any part of the optic radiations, hence in the higher mammalian forms this nucleus becomes insignificant. It also receives, in the higher mammals, only crossed fibers of the optic tract, a reminder of the complete decussation of the retinal nerve fibers which is found in the lower vertebrates.

But the dorsal nucleus of the lateral geniculate body has steadily increased in complexity in the higher mammals, and its most significant connections are those which run between it and the occipital cortex to form the optic radiations.

The three suborders of the primates, as generally recognized, are the Lemuroidea, the Tarsioidea, and the Anthropoidea. Of these the suborder Tarsioidea is at present represented by only one genus, Tarsius, or the spectral tarsier already referred to.

According to Le Gros Clark, the arrangement of the cell layers in the dorsal nucleus of the lateral geniculate body, in the three suborders just mentioned, throws important light on the much debated question as to the exact relationship between the Anthropoidea and the Lemuroidea. In the primitive primate the cells of the nucleus are arranged in three layers which have not been folded in any direction. In the Anthropoidea the six cell layers which make up the nucleus have become folded into a dorsal convexity from which the optic radiations emerge; whereas in the Lemuroidea the layers of the nucleus have been folded in an opposite or ventral direction, so that the optic radiations emerge from a concavity. Thus in the course of evolution the expansion and increasing complexity of the nuclei, as found in the Lemuroidea and the Anthropoidea, appear to have diverged in two opposite directions from a primitive ancestral type which is probably represented by Tarsius.

It is to be hoped that further refinements in cerebral microscopy and embryology will continue to add to our understanding of those evolutionary problems which are particularly related to the ascent of man's intelligence above that of his fellow primates.

W. H. Crisp.

A TEACHERS SECTION OF THE AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

There have been notable changes in medical education during the past fifty years, due largely to the tremendous increase in medical knowledge, necessitating a more complete premedical education as well as additional years in the prescribed medical course.

It has become increasingly difficult, if not impossible, for any one man to master the entire subject, so there has developed a problem as to how the benefit of this increased knowledge of the diagnosis, prevention and treatment of disease can be utilized for the benefit of the patient. As an answer to this, however inadequate, specialism has arisen.

Since sufficient training in the specialties cannot be given in the routine medical school course, the teaching of medicine has been divided into undergraduate and graduate. There has been a tendency to decrease the amount of specialty training in the undergraduate curriculum, confining such training to the specialty in its relation to general medicine, and to increase graduate teaching. This has been on account of the necessity of adding more and more to general medical and surgical teaching in the schools and the recognition

that those who desire to know the specialties as such must seek further than the undergraduate school.

The World War undermined the influence and seriously interfered with the instruction offered by the graduate schools of Europe, so that the necessity of giving such courses in our own country became imperative.

Unfortunately teaching of the specialties has been rather undirected, being practically under the sole guidance of the medical schools, each one groping about in an endeavor to fulfill this function as well as possible. Though the ideal graduate instruction may be known to those in authority, physical limitations have been too stringent. There should be some central guiding influence, an organization where those interested in the teaching of a specialty could meet and discuss the problems related to that subject. The American Academy of Ophthalmology and Otolargyngology is particularly fitted to sponsor such an organization containing as it does the best in ophthalmology and otolaryngology. It should be possible to formulate a general plan for ophthalmic teaching. The necessity of unity of purpose is obvious and almost equally obvious is the desirability of centralization of effort.

There is great danger of unnecessary reduplication to the benefit of no one and to the considerable detriment of all. Any place in our country can be reached in a short time from any other place in our country, by train, motor or plane. There is no reason why it should not be possible to give instructional courses of any desired comprehensiveness in any branch of any specialty. The men are here, sufficient money is available, the profession is keenly desirous of such opportunities; the connecting link is some directing body to plan with the various organizations interested in giving this type of teaching. For lack of such a plan mixed short courses are the vogue. These are undoubtedly excellent but there are needed also longer courses where those who wish to make an earnest study of one or more particular features of his specialty may do so.

This section of the Academy could aid not only in the above but could probably also give much needed courses of instruction to teachers. The necessity of normal schools has long been recognized by other educational units and undoubtedly what applies to them applies to medicine. There are many teaching our students today who have none of the qualifications of teachers and should be directing their attention to other phases of medicine. There are others who have the qualities of making good teachers but lack knowledge of how to utilize their gifts.

This latter field has been practically untouched but it will not be long before the necessity of doing something of this nature will be realized and there is no organization in America better qualified to take the lead as far as the specialties of ophthalmology and otolaryngology are concerned than the American Academy of Ophthalmology and Otolaryngology. *Lawrence T. Post.*

BOOK NOTICES

The human eye and its hereditary tendencies. By Dr. P. J. Waardenburg. Cloth, 631 pages, with 8 colored plates and 197 test figures. Martinus Nijhoff Haag, 1932.

This piece of work is so comprehensive that in a short review one cannot touch upon all that Waardenburg has been able to collect on the subject from his own observations and the reports in the literature. His study was begun in connection with his doctor's thesis, 1912, and has been continued, culminating in the present formidable publication.

In the concluding chapter of the book the author outlines what remains to be done in research in this field and sets down in order what has been established in the present survey of heritable tendencies in the human eye. Excerpts from this chapter may serve to indicate the nature of some of these facts and their relationships:

"We find that the same clinical picture may rest upon recessive as well as upon dominant inheritance; again illus-

trating that genotype and phenotype do not run parallel.

"The recessive sex-linked inheritance in the eye is very nearly established for megalocornea, partial albinism with loss of macula, special forms of nystagmus, partial anomalies of color-sense, hemeralopia with myopia, Leber's atrophy of the optic nerve, atrophy of the iris with glaucoma, a form of retinitis pigmentosa, of cataract, of microphthalmos, and of macular degeneration. The eye may be drawn into involvement with some recessive sex-linked skin and nerve diseases. This signifies that hereditary factors localized in the sex chromosomes also have an effect upon the normal structure and function of the cornea, retina, and the eye as a whole. Hence there is no obstacle to assuming that such genes likewise are distributed among the autosomes and that an alteration in them may occur in connection with similar or different hereditary passage-ways when the clinical pictures are related.

"Multiple allelomorphism may be assumed for the heretability of disturbances in color-sense and in the color of the iris.

"Polymeria of similarly directed factors of intensity may well have an influence upon corneal refraction, size of the corneal disc, and probably also upon the color of the iris.

"Simple regular dominance was present, for instance, in the following characteristics: isolated ptosis, ptosis with blepharophimosis, ptosis with ophthalmoplegia (congenital and acquired forms), distichiasis, epicanthus, dark coloration of the lids, convergence strabismus (inward squint), corneal opacities (degeneration), blue sclera, aniridia, several forms of cataract, lenticular ectopia, spontaneous luxation of the lens with arachnodactylia, glaucoma, hemeralopia, individual forms of retinitis pigmentosa, microphthalmos with myopia and ectopia of the pupil."

"Dominant but more irregular was the inheritance for instance of nystagmus, iritic and other colobomas, microcornea, astigmatism, flocculi iridis, several forms of macular degeneration, and Lindau's disease."

There is an interesting chapter on eye factors in twins. The author concludes with the words, "It would be no exaggeration to assert that the biologic-genetic direction of research has made ophthalmology richer by the addition of many facts and has brought to our understanding some of its basic truths. Many of its problems can be solved only by the aid of further studies in this field."

The only adverse criticism the present reviewer could offer would be on account of the weight of the book which makes it wearisome to handle.

E. S. Buss.

Bulletin de la Société Belge d'Ophtalmologie. (Bulletin of the Belgian Ophthalmological Society), no. 63. Transactions of the 63rd meeting of the Society at Brussels, November 29, 1931. Paper covers, 116 pages, illustrated. Published by the Society. Price not stated.

The Bulletin includes a list of members and twenty-one papers with discussions. Among the subjects dealt with are the following:

Fugacious edema of the papilla and the macula by de Vaucleroy; Nodular keratitis of Groenouw, by J. H. Coppez; A case of pseudo foreign body of the eye, Leon Coppez; Spontaneous cure of retinal detachment—What are the possibilities of functional recuperation of a detached retina?, L. Weekers and R. Hubin; Is the vitreous body a tissue?, G. Leplat; The former state of the eyes in cases of industrial accident, de Mets; Elasticity caliber and pressure of the retinal artery, Fritz; Wassermann reactions on the aqueous humor of the normal or syphilitic hare, before and after various injections into the anterior chamber, J. Van Conneyt.

Abstracts of some of these articles will appear in a later number of this Journal.

J. B. Thomas.

Transactions of the Ophthalmological Society of the United Kingdom. Volume 51, Session 1931. Cloth covers, 687 pages. Published by J. and H. Churchill, London, 1932.

This is an extremely interesting and comprehensive publication containing over 650 pages of original papers, profusely illustrated. The book is well printed on excellent paper. It contains beautiful plates and is well bound.

Space does not permit the mention of more than a few of the articles.

R. C. Davenport had the opportunity of examining a patient who had had frequent attacks of unilateral amblyopia. Three attacks were watched with the ophthalmoscope. There was noted a fixed, dilated pupil, very pale optic disc, exceedingly narrowed arteries, broken venous columns, no haziness of the retina or optic disc and nothing resembling a cherry-red spot at the macula. As the attack passed, the artery and veins filled rapidly. Simultaneously the optic disc became pink. Sight was fully regained a few seconds after the return of normal appearance. Such attacks of spasm of the retinal arteries are often suspected but rarely seen.

S. S. Meighan reported a case of retinitis pigmentosa treated by sympathectomy of the superior cervical ganglion, which was followed by a definite improvement in fields and vision of both eyes. The realm of the speculative in medicine is always of interest and especially if there might be a clinical application to an otherwise hopeless condition.

The contribution to the popular Gonin operation is a report by C. C. Shapland on the results of 100 cases of retinal detachment treated by this operation. Forty were discharged from the hospital cured and seventeen showed improvement either in visual acuity or visual field. By cured it is understood that the retina was in proper place and visual field full.

In addition to the papers read before the Society during the session there are included the Oxford Ophthalmological Conference, the Transactions of the Midland Ophthalmic Society, Transactions of the North of England Ophthalmic Society, and the Transactions of the Irish Ophthalmic Society.

Lawrence T. Post.

CORRESPONDENCE

Reactions between the eye and the ear

There have been so few published observations on the interpretation, nervous and vascular, between the eye and the ear, that Dr. Walker's inference, made in his excellent article in the March number of the Journal that "Dr. Herman Knapp is the author of the first and only paper in the English language which bears at all on this subject", while natural is not wholly correct. The writer, impressed by some unusual clinical experiences in which aural symptoms disappeared after the relief of eye strain reviewed the subject in a paper read before the American Academy of Ophthalmology and Otolaryngology at the annual meeting held at Cleveland in 1908. This paper was published in the Transactions of that year. It was entitled "The ophthalmic origin of otic disturbances with the cerebellar control of the eyes." His impression too, on preparing this paper was that his observations were unique but he discovered that "As long ago as 1881 Dr. George T. Stevens, in a remarkable though brief paper read before the International Medical Congress entitled 'On certain conditions of the eyes as a cause of loss of hearing by reflex irritation,' enunciated some principles and cited instances that at least established a basis for future study in this important but hitherto unknown field of research. He quotes the law that the same peripheric source of irritation acting on the same centripetal nerve may produce the greatest variety of effects, including every functional nervous affection and disorder."

In 1895 Dr. Arthur A. Boyer, in a paper entitled "The relative importance of labyrinthine and ocular defects in the etiology of vertigo", which was read before the Neurological Section of the Academy of Medicine, New York, reviewed the subject elaborately and cited

cases in which vertigo and lowered hearing were associated with refractive errors or muscular imbalance which disappeared on the reëstablishment of ocular efficiency.

A further quotation is so relevant that it may be permitted. "It was not until the meeting of May, 1907, that this unusual subject seems to have received further attention, when Dr. Marcel Rollet of Blois, in a profoundly interesting and valuable paper read before the Société Francaise d'Oto-rhinolaryngologie and published in the Revue Hebdomadaire for December, presented further new observations and completely reviewed the entire subject in a paper entitled 'de l'influence de l'oeil sur l'oreille a l'etat normal et pathologique' and adds to the observation already made. He arrives at the conclusion that 'there exist between the organs of vision and those of audition certain relations—both direct and indirect—relations which the nervous connections, both central and peripheric, of the two organs suffice to explain, and it must be admitted that in the case of objects which may be recognized by the two organs the excitation of the one of them may awaken through the association fibers the images of the memory belonging to the other organ'."

The work of Rollet seemed of distinct importance and the writer translated it in full. It was published in the Annals of Ophthalmology for that year. In the discussion which followed and in which Holloway, Friedenberg, Barck, Jos. Beck, Harold Gifford, and Dayton participated, additional observations were recorded. The amount of literature published in English therefore, has been by no means inconsiderable nor unimportant, and as a matter of record it should not be overlooked. Those interested in the subject will doubtless be glad to have it recalled to their attention. *Park Lewis.*

Uveitis due to sinusitis

The use of improper definitions is partly to blame for the spread of the theory of focal infections. In order to use properly the word "due" one must prove scientifically the causal relationship between the result and the focus. In my opinion, the article by Dr. Edgerton (Amer. Jour. Ophth., v. 15, June, p. 546) does not prove such relationship, and the proper title should be "Improvement of uveitis after an operation of the antrums".

The history presented by Dr. Edgerton is incomplete, there being important omissions.

1. What was the diagnosis of the disease of the antrums? Was it a chronic inflammatory condition, tuberculosis, lues or something else? No microorganisms could be cultivated, no microscopic pictures of the diseased tissue have been presented and no microscopic diagnosis mentioned.

2. It is not known how long the uveitis has existed before the operation and how long the patient has been observed after the operation. This is the only remark the author made: "The uveitis in this case has been present for some time".

3. The author stated: "Ten days after the operation she was able to go to the breakfast table for the first time in three years". Why? Her vision according to the author was 6/20 in each eye. One must think that the patient was unable to walk or was in constant pain. The history does not give definite information on this matter. It seems to me that she could walk because in the words of the author she "came" to his office. If she could walk and could see enough, why could she not eat at the table? Pain does not depend upon the place of eating.

4. Were there objective symptoms of chronic arthritis? I cannot depend upon the history for a definite answer. It seems to me that the author relied on the words of the patient rather than on objective signs. According to the author "The general physical examination was negative".

In three days after the operation the patient got rid of all pain. Can one imagine that chronic arthritis which has lasted for several years and has not yielded to any kind of treatment, vac-

cine and tonsillectomy included, has not produced anatomical changes in the joints and tissues? How could the pain so miraculously disappear in three days? If one is not dealing with a neurotic, what is the explanation? I am at a loss to find a satisfactory one. If the cure was so miraculous and complete, why give iodine preparations and mercury inunctions afterwards? Does it not show that there was some doubt in the subconscious mind of the author whether the uveitis was "due" to the sinusitis? Local treatment (atropine and hot compresses), psychic effect of the operation and blood-letting connected with the latter should not be overlooked in such cases as the cause for improvement. *O. R. Lourie.*

OBITUARY

George Washington McCoy
1871-1932

On April 21, 1932, Dr. G. W. McCoy died of a thrombosis of the coronary artery. Late in February, he suffered an attack of influenza and was ill for four weeks. He finally insisted upon leaving his bed to care for his patients although his own condition was still unfavorable.

Dr. McCoy was born on a farm at Bellebrook, Ohio, January 14, 1871. He received his bachelor's and master's degrees from Ohio Wesleyan University and was a member of Phi Beta Kappa fraternity. He was graduated with honors from Miami Medical College and was valedictorian of his class. Following his medical schooling, he engaged in hospital work for a number of years in Cincinnati, New York City, Vienna, London, and Glasgow. His splendid education was financed entirely by his own efforts.

Approximately twenty-four years ago, he went to Los Angeles as an associate of Dr. A. C. Rogers and his brother, Dr. Thomas Jefferson McCoy, both of whom are now deceased. Dr. McCoy took up their work, adding it to his own growing practice and became one of the foremost ophthalmologists and otolaryngologists on the Pacific Coast.

Behind the unassuming good nature and instinctive geniality of Dr. McCoy, there lay a great reserve of ability. He was nationally known for his exceptional skill in mastoid surgery. His carefully prepared contributions to the medical literature were received with respect and approval.

He was beloved by all—the wealthy and prominent, as well as the poor and destitute to whom he devoted so much time and effort in the free clinics of the General Hospital. He was an indefatigable worker whose interest in his profession never permitted time for sufficient rest and vacations.

Dr. McCoy will be greatly missed not only by his patients and family, but by his colleagues who looked to him for counsel and leadership. He had a deep sympathy for medical students struggling under the burden of inadequate financial means. Many of these were relieved of worry and enabled to complete their courses through his generous help.

Dr. McCoy held membership in the following organizations: American Medical Association, American College of Surgeons, National Board of Medical Examiners, Pacific Coast Oto-ophthalmological Society, Southern California Medical Association, Clinical and Pathological Society of Los Angeles, Symposium Society of Los Angeles, Los Angeles Ophthalmological Society and Los Angeles Society of Ophthalmology and Otolaryngology; charter member of the Research Study Club of the Eye and Ear Section of the Los Angeles County Medical Association.

He held appointments as Chief of Attending Staff, Eye Service, Los Angeles County General Hospital, and was a member of the Senior Staff and Executive Medical Board of the California Lutheran Hospital. He was a member of the Medical Faculty of the University of Southern California and in the past had been Associate Professor of Ophthalmology in the Los Angeles School of Physicans and Surgeons. *Wm. A. Scruton.*

ABSTRACT DEPARTMENT

EDITED BY DR. WILLIAM H. CRISP

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases and parasites
18. Hygiene, sociology, education, and history
19. Anatomy and embryology

3. PHYSIOLOGIC OPTICS, REFRACTION AND COLOR VISION

Jackson, E. **The share of the crystalline lens in ocular refraction.** Trans. Amer. Acad. Ophth. and Oto-Laryng., 1931, p. 66.

The records of 644 cases of refraction followed for over ten years are analyzed. Measurements with the ophthalmometer, skiascopy, and subjective testing allow estimation of the part played by cornea and lens in the refractive changes. The spherical refraction of the cornea had changed more than one diopter in only twenty-two days. A slight tendency to increased corneal refraction was seen in early life, while in later middle life such changes were of slight importance. Changes of one diopter or more in the amount of corneal astigmatism occurred in forty-four eyes, the greater changes being in young people. Changes in refraction requiring a change of glasses occurred in all but six cases. The number of changes in glasses required for any one patient was from four to ten, and in nearly all the cases this was due to changes in the crystalline lens. Slight changes in lenticular refraction are an important cause of eyestrain, and require frequent examination for their detection. (Discussion.)

George H. Stine.

Kravkov, S. W. **The influence on the differential sensibility of the eye through accessory stimuli.** Graefe's Arch., 1932, v. 128, p. 105.

The differential sensibility of one eye is diminished by directing light into the fellow eye. This diminution may be explained as the result of an added stimulus to the central visual center of the eye under observation. In comparison with the amount of the accessory stimulus the size of the added central stimulus is only several hundredths of one percent. The author elaborates the mathematics of the relationship.

H. D. Lamb.

O'Brien, C. S. **Astigmatism: its accurate determination and correction.** Trans. Amer. Acad. of Ophth. and Otolaryng., 1931, p. 75.

The author emphasizes the importance of astigmatism as the factor responsible for nearly all cases of asthenopia. Its accurate correction he regards as of far greater practical importance than the correction of spherical errors. In his belief, skiascopy with cylinders is the most accurate method of determining the axis and amount of astigmatism. The technique of skiascopy with cylinders is described and illustrated. It is better slightly to undercorrect the astigmatism found than to overcorrect it, as the resulting prospect of discomfort is less. (Discussion.)

George H. Stine.

Pascal, J. I. **Fundamentals of dynamic retinoscopy.** Arch. of Ophth., 1932, v. 7, April, pp. 515-520.

Dynamic retinoscopy, as recommended by the author, is concerned mainly, though not exclusively, with methods for determining the proper lens correction for comfortable work at close range. Three tests are made: one for finding objectively the monocular amplitude of accommodation; one for finding equality or inequality of accommodation while both eyes are simultaneously accommodating and converging, and one for determining the lens correction necessary "to correlate best the associated functions of accommodation and convergence in the act of single binocular vision." The technique of these procedures is discussed. *M. H. Post.*

Pflugk, A. **New methods of investigating the theory of accommodation.** 1. Freezing with CO_2. Graefe's Arch., 1932, v. 128, pt. 1, pp. 179-200.

The writer has undertaken to measure the elasticity of zonula and capsule in animals and man. Using the Deforden apparatus (a device for measuring tensile strength of textiles), he found that in the eye of the horse the zonula is six times as elastic as the capsule; in the pig the anterior capsule is twice as elastic as that of the horse; in the calf the zonula is twenty-five percent less elastic than in the horse; in the dog the results are about as in the horse; and in man the capsule is about as elastic as in the pig, but the zonula is nine times as elastic as the capsule. These results, the writer thinks, confirm the observations of Rabl and Vogt, that the zonular fibers do not arise from the ciliary processes, as has so long been taught, but from farther back in the region of the orbicularis ciliaris to about the ora serrata.

The author argues that the accommodative changes in the lens can be explained only as the result of shifting of the vitreous toward the axis of the eye, due to pressure of the ciliary muscle, first of all the muscle-fiber bundle lying against the vitreous. His present experiments confirm the conclusion to which he came in 1908 relative to the eye of the turtle; namely, that the human lens departs from its position of rest with increase of accommodation. *E. S. Buss.*

4. OCULAR MOVEMENTS

Asian Perez, J. **Features of diplopia in paralysis of vertical rotators.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, March, p. 121.

Students are confused, in dealing with paralysis of vertical rotators, by tables showing involvement of isolated muscles. In previous articles the need for taking into consideration the simultaneous activity of other muscles and the different behavior of the vertical rotators in abduction and in adduction have been stressed, particularly in the matter of lateral separation. Morax, Landolt, Terrien, Bielschowsky, and others have called attention to the fact that the diplopia in paralysis of vertical rotators is often against the rule, particularly in traumatic ophthalmoplegias, of which Terrien considers this a characteristic feature. Preexisting heterophorias and the mechanical action on motility of the globe of hemorrhages and cicatricial bands have been blamed for these anomalies. In view of the frequency of these anomalous behaviors, and considering that the vertical recti, although primary adductors, must become abductors in external rotation of the globe beyond twenty-three degrees, the change from crossed to homonymous diplopia must be considered normal and physiological. The same reasoning applies to the obliques, except that the main vertical rotators are the recti. A case of inferior rectus paresis and one of paralysis of the superior rectus of traumatic origin illustrate the opinion, and the contrary polemic of Ribas Valero is dealt with at length.

M. Davidson.

Hartleib, Robert. **Exercise and measurement in the treatment of squint.** Klin. M. f. Augenh., 1932, v. 88, March, p. 344. (Ill.)

The author discusses the field of application of his apparatus, which serves for exercise and for measuring the amount of squint. *C. Zimmermann.*

Hesse, Robert. **Ocular movements and squint.** Graefe's Arch., 1932, v. 128, p. 145.

Observations on the lateral excursions of the eyes in squint have now been carried on by the author since 1911. The number of cases studied was 185, of which 157 were internal and 28 external squint. Measurements of the squint angle and of the angles of lateral excursion of the eyes were taken on the ordinary perimeter with the aid of a candle flame. Among the 157 cases or 314 eyes with internal squint, in 290 eyes or over ninety-two percent a normal lateral amplitude of excursion of over 80° was present. Only 24 eyes remained subnormal and 18 of these were over 75°, so that only 6 eyes could be said to have an important limitation of range of lateral motion. Among the 56 eyes with external squint studied, only one eye was below the 80° limit and none under 75°. The author's results thus confirmed the old statement of Graefe, that in strabismus the amplitude of lateral movement of the eyes is not shortened but only displaced inward or outward. Of the 157 cases with internal squint, 14 were emmetropic, 128 hypermetropic, 6 myopic, and 9 were undetermined. Of the 28 cases with external squint, 11 were emmetropic, 5 myopic and 12 hypermetropic. In 9 cases of external squint, this dynamic factor from the error of refraction did not explain the discrepancy between the actual squint angle and that computed from the lateral excursions of each of the two eyes. In 86 to 87 percent of all the squint cases, both eyes participated in causing the anomalous position or squint. In over 50 percent, both eyes shared in this approximately to an equal degree. *H. D. Lamb.*

5. CONJUNCTIVA

Maghrabi, A. **Pathological similarity between trachoma and syphilis.** Bull. Ophth. Soc. of Egypt, 1931, v. 24, pp. 54-62.

The author, having observed the fact that trachoma patients under treatment for syphilis with neosalvarsan showed a smooth conjunctiva and a clear cornea at the completion of a course of six salvarsan injections, began a systematic examination of all new patients in Kars-El-Aini hospital, and observed the progress of the trachomatous lesions while the patients were under treatment for syphilis. A high percentage of cures were obtained, especially in cases where local treatment supplemented the salvarsan injections. As a control experiment twenty-five nonsyphilitic trachoma patients were treated with neosalvarsan. Of these, twenty-two were more or less completely cured, those receiving local and general treatment recovering much more quickly than those receiving salvarsan treatment alone.

The similar features of the pathology of trachoma and syphilis are outlined by the author, who draws from this similarity the conclusion that trachoma like syphilis is not a purely local disease but a local manifestation of a general disease. In the light of the foregoing study and observations the following theory is propounded. In the etiology of trachoma two factors are concerned: (1) a general factor, systemic infection with a parasite, most probably protozoal; and (2) a local factor which embraces two elements, (a) a predisposing element such as dust, bad hygiene, nasal infection, trauma; and (b) an exciting factor, bacteria which vary in different localities.

Edna M. Reynolds.

Miklós, Andre. **Sterilization of the conjunctival sac with more recent bactericidal substances.** Klin. M. f. Augenh., 1932, v. 88, March, p. 359.

On fluid culture media in vitro, and in the conjunctiva of rabbits, Miklós tested the bactericidal power of trypaflavin, rivanol, protargol, argil, argolaval, lapis, and argyrol for bacteria most frequent in the conjunctival sac. The results, arranged in tabular form, proved trypaflavin, argolaval and argil to be the most powerful. He continues to use argyrol before operation. Its bactericidal action was the weakest, but in from 10 to 25 percent solutions, even after dilution by the tears, it was

stronger than 0.25 to 0.125 percent solutions of the others. *C. Zimmermann.*

Wilson, R. P. **A discussion of the etiology of trachoma with special reference to Bacterium granulosis (Noguchi).** Bull. Ophth. Soc. of Egypt, 1931, v. 24, pp. 36-53.

A detailed account of the most recent developments regarding the etiology of trachoma is given by the author. (1) Regarding a filterable virus as the causative agent in trachoma, experimental results are conflicting and radically different opinions are held. (2) The view that inclusion bodies represent living parasites is not supported by recent investigations. Recent investigations show that inclusion bodies can be induced in experimental animals by inoculation of the conjunctiva with various organisms and with chemicals. (3) The publication of Noguchi's work regarding Bacterium granulosis in 1926 stimulated a revival of interest in the problem of trachoma. Many American workers have published confirmatory reports on Noguchi's findings, but the evidence from other countries is not reassuring. The results of the author's work with Bacterium granulosis are to date inconclusive and he believes that we shall never arrive at any determinate conclusions so long as we confine our experiments to animals, because no animal shows typical trachoma when inoculated with human trachoma. The problem of the etiology of trachoma will only be settled as the result of human experiments.

Edna M. Reynolds.

6. CORNEA AND SCLERA

Attiah, M. A. H., and Sobhy Bey, M. **Blue sclerotics.** Bull. Ophth. Soc. of Egypt, 1931, v. 24, pp. 67-75.

A review of the literature regarding blue scleras and their association with various pathological conditions, such as fragility of the bones, hyperflexibility of the joints, otosclerosis, and endocrine disorders, is given and a case of blue scleras in a child of ten years is reported. The family history was negative. The scleras were leaden blue and conical cornea was present. The child was markedly undersized. The teeth were irregular, showed defective enamel, and were subject to caries, and the permanent teeth were late in eruption. X-ray pictures of the bones showed them to be normal except for slight bowing of the tibiæ. The muscles showed marked flaccidity and there was hyperflexibility of the joints, probably due to weak ligamentous structures. There was no derangement of the endocrines at the time of examination. The authors believe that the changes in the bones, scleras, and ligaments are explained by endocrine dysfunction occurring prior to the time of examination. *Edna M. Reynolds.*

Custodis, Ernst. **Scleral cysts.** Graefe's Arch., 1932, v. 128, p. 112.

For four or five months the parents had noticed a tumor in the left eye of their three-and-a-half-year-old child. A whitish translucent growth 4 to 6 mm. wide lay on the corneal margin from the twelve to the three o'clock position. With the light cone from the slit-lamp, it was possible to transilluminate the anterior wall of the swelling and to prove that the tumor had clear fluid and a posterior wall. Under local anesthesia, the anterior wall of the cyst was removed and the conjunctiva over the defect was sutured. Microscopic examination of sections from the cyst wall disclosed an outer loose connective tissue layer, next a dense scleral coat, and innermost an epithelial lining of three layers of generally flattened cells.

H. D. Lamb.

Filatov, V. P., and Velter, S. L. **On transplantation of the cornea.** Sovietskii Vestnik Opht., 1932, v. 1, no. 1, p. 15.

Filatov and Velter maintain that chances for successful keratoplasty are very favorable in cases of deep and extensive corneal opacity in which the intraocular pressure is not increased and the anterior chamber is normal in depth. They report two new cases of this type in which they obtained excellent results through the use of the Hippel-Elschnig technique. The transplant remained

permanently transparent, the fundus could be seen easily through it, and the visual acuity obtained was of 0.4 in one case and of 4/60 in the other (with amblyopia and nystagmus!).

M. Beigelman.

Kraus, A. C. **The chemical constitution of the sclera.** Arch. of Ophth., 1932, v. 7, April, pp. 598-600.

The author has reinvestigated the chemistry of the sclera. His analysis shows:

Constituent	Tissue	
	Fresh, percent	Dry, percent
Water	72.240	
Solids	27.760	
Inorganic matter	0.704	1.951
Organic matter	27.056	98.049
Mucoid	2.318	8.192
Collagen (gelatin)	22.139	81.045
Elastin	1.450	5.116
Albumin and globulin	0.561	1.612
Water-soluble extractives	0.516	1.823
Fat (ether-soluble matter)	0.072	0.261

M. H. Post.

Löwenstein, Arnold. **The pathogenesis and therapy of parenchymatous keratitis.** Klin. M. f. Augenh., 1932, v. 88, March, p. 306. (Ill.)

Clinical and experimental investigations led Löwenstein to believe that anatomical changes of the pericorneal vascular system which produce disturbance of nutrition of the parenchyma of the cornea are the primary causes of hereditary syphilitic parenchymatous keratitis. These changes are chiefly in the adventitia, whereas the specific tuberculous affection is an endophlebitic process which attacks the vascular wall secondarily and from here the surrounding tissue. From Löwenstein's view of circulatory inhibition as an etiological factor the logical treatment of parenchymatous keratitis ought to be stimulation of active hyperemia by warm applications, dionin, massage with mercurial ointments, subconjunctival injections of salt solution, short-waved (ultraviolet) and long-waved light, and roentgen rays, one of the strongest means of producing hyperemia. He illustrates his excellent results with roentgen rays by several clinical histories.

C. Zimmermann.

Rommel, J. C. **A treatment for corneal macula and leucoma.** Medical World, 1932, v. 50, May, p. 156.

The author feels that he has obtained decided thinning of corneal scars from subconjunctival injection of 1 to 1.5 percent solution of sodium iodide, the initial dose of two minims being gradually increased to a maximum of from fourteen to twenty minims.

W. H. Crisp.

Tobgy, A. F., and Wilson, R. P. **Tattooing of the cornea with platinum chloride.** Bull. Ophth. Soc. of Egypt, 1931, v. 24, pp. 16-20.

A summary of the methods of tattooing employed in the past is given, concluding with a discussion of chemical reduction methods. Krautbauer's method of using platinum chloride with hydrazine hydrate as a reducing agent is then outlined, and results obtained in eleven cases operated upon by this method are reviewed.

Edna M. Reynolds.

Wilson, R. P., and Tobgy, A. F. **Phenolaine in the treatment of corneal nebulæ.** Bull. Ophth. Soc. of Egypt, 1931, v. 24, pp. 117-122.

The authors give a report of forty cases of corneal nebula, from various causes, treated by phenolaine (dimethyl - diethyl - diphenylmonobenzoicamin). Subconjunctival injections of 1 c.c. of a 0.4 percent solution of phenolaine in sterile water were given weekly, the average number of injections given being nine. Most cases showed very little rarefaction of the scar tissue and very slight improvement in vision after treatment. The authors conclude from their observations that phenolaine does not appear to possess any definite advantages over such remedies as yellow oxide of mercury and dionin in the clearing of corneal nebulæ, and that in comparison with the well known simple absorbent emollients the method is laborious and is sometimes followed by unpleasant sequelæ, such as cicatriza-

tion of the subconjunctival tissues, which are otherwise never seen.

Edna M. Reynolds.

7. UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Agnello, F. **Contribution to the study of traumatic glaucoma.** Lettura Oft., 1931, Oct., p. 520. (See Section 8, Glaucoma and ocular tension.)

Biantovskaia, E. T. **Herpes iridis.** Sovietskii Vestnik Opht., 1932, v. 1, no. 1, p. 33.

Herpetic lesions of the iris as a rule accompany similar affections of the cornea. In rare cases they occur without corneal involvement. On one occasion the author observed an iritis with dark precipitates on the posterior surface of the cornea in association with herpes zoster. An identical type of iritis was seen in a malaria patient who had had in the past an attack of corneal herpes. The third case of herpetic iritis was characterized by recurrent hemorrhages into the anterior chamber. This patient developed a secondary glaucoma, and iridectomy was resorted to. The piece of iris removed at operation was examined pathologically, and an atrophy of the iris stroma with some increase of fibroblasts and with intact pigment epithelium was found.

M. Beigelman.

Friedenwald, J. S., and Pierce, H. F. **The circulation of the aqueous: 1. Rate of flow.** Arch. of Ophth., 1932, v. 7, April, pp. 538-557.

The anterior chamber of the eye of an animal was connected with a movable reservoir of salt solution by a capillary tube containing a bubble of air, the movements of which could be recorded when the balance between the pressure in the reservoir and that in the eye became disturbed. Great care was taken to interfere as little as possible with the intraocular pressure and the blood pressure. The normal circulation of the aqueous was undisturbed. But when the normal outflow was interfered with by injection of various colloid dyes into the anterior chamber, the outflow was diverted through the canula, resulting in measurable displacement of the bubble. Following such an injection, the bubble was found to move away from the eye at the rate of about 1 c.mm. per minute. Before accepting this finding it was necessary to determine that the conditions of the experiment met all requirements. The various factors involved have therefore been analyzed with these requirements in mind, and have been found satisfactory to the authors. This result was further substantiated by one remarkable case in man. Finally the chemical composition of the aqueous was shown to be compatible with this velocity of flow.

M. H. Post.

8. GLAUCOMA AND OCULAR TENSION

Agnello, F. **Contribution to the study of traumatic glaucoma.** Lettura Oft., 1931, Oct., p. 520.

Seven cases of glaucoma are described in this paper. Five of the seven gave a history of injury. In these, acute glaucoma appeared in from forty-eight hours to several months following the trauma. The remaining two cases were amaurotic for three and twenty years respectively, and in each of them a luxated lens was present. In each case, glaucoma appeared suddenly and without trauma.

The author classifies traumatic glaucoma into two types, direct and indirect or primary and secondary. The secondary type is accompanied by grave alterations in the ocular membranes, anterior and posterior luxation of the lens, ruptured sclera with more or less extensive injury to the uvea, and seclusio pupillæ; any of which changes offers sufficient reason for the resulting hydraulic disturbances. In this type the determining cause is indisputable.

In the primary type, where appreciable alteration in the ocular membranes is absent, the author, contrary to the views of others, admits that at least from the medicolegal standpoint trauma is the cause of the glaucoma.

He further believes that according to Magitot this glaucoma depends on a reflex stimulant or depressant action on

the peripheral intraocular sympathetic nerves by contusion. *F. M. Crage.*

Demetriades, Jean. **Modifications of ocular tonus during accommodation in the normal state and in some pathological conditions.** Bull. Ophth. Soc. of Egypt, 1931, v. 24, pp. 9-15.

Having observed that the indicator of the tonometer registered differently when a patient was fixing a near object and when he was fixing a far object the author undertook a series of investigations to find out whether there was a change in ocular tension during accommodation. He took the corneal and scleral tension in normal and pathological conditions in patients whom he had occasion to examine. In normal eyes (ten cases) he found the corneal tension during the act of accommodation 2 mm. higher than the tension in a static condition. In normal eyes, scleral tension taken simultaneously with corneal tension, by means of the Bailliart tonometer, always showed a slight increase during accommodation. In twelve pathological cases, including cases of cataract, glaucoma, high myopia, iridocyclitis, and staphyloma of the cornea, the author found an average increase of 3 mm. in both corneal and scleral tension during accommodation.

No attempt is made to explain the mechanism of this increase in pressure or to correlate general intraocular pressure with retinal pressure during accommodation. *Edna M. Reynolds.*

Ferrer, H. **Tonometry before and after cataract extraction.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, March, p. 141. (See Amer. Jour. Ophth., 1932, v. 15, April, p. 324.)

Rossi, V. **Primary glaucoma and the organic constitution.** Arch. di Ottal., 1932, v. 39, Jan., pp. 1-50, and Feb., pp. 51-85.

The entire organism must be taken into consideration. Dysfunction of the endocrine glands and the sympathetic nervous system are discarded as primary factors. Generally in the background there is a breakdown in the circulatory system as evidenced in diffuse and limited arteriosclerosis with or without hypertension, or a disturbance in the water exchange or sugar metabolism. Importance is attached to the acid-base equilibrium and the cholesteremic curve. Not only by mechanical disturbance of the perichoroidal space, anterior chamber, and vitreous, but also by the chemical and physical constitution of the intraocular fluids, hydration of the ocular colloids may be increased by diminution of alkalinity or by accumulation of carbon dioxide.

A. Town and F. Pagano.

9. CRYSTALLINE LENS

Bakry, M. **Posterior cataract extraction.** Bull. Ophth. Soc. of Egypt, 1931, v. 24, pp. 23-26.

A description of the procedure in cataract extraction through the posterior sclera and reports of five cases of senile cataract so operated upon are given. The procedure is as follows: A fixation suture is inserted in the upper outer corner of the limbus and held by an assistant. After a subconjunctival injection, the incision is made in the upper outer quadrant of the globe about 8 to 9 mm. from and parallel to the limbus. One stitch is passed through the lips of the future section. An incision 11 mm. long is made with a guarded keratome. Closed lens forceps are then introduced through the lips of the wound and pushed carefully toward the circumlental space. By watching through the cornea the forceps will be seen through the fibers of the suspensory ligament, between the equator of the lens and the border of the dilated pupil. The forceps are then opened and the upper end is pushed over the anterior capsule of the lens. The diverging limbs of the forceps cause the fibers of the suspensory ligament to break, with a corresponding subluxation and tilting of the lens. The forceps are closed upon the lens, which is freed of its attachments and carried gently out of the wound.

The main defect of the operation is the loss of vitreous, which, however, is not accompanied by the same complications here as in anterior flap sec-

tions. When the vitreous is of normal firm consistency no loss ordinarily occurs after making the section, but only a small amount is found sticking to the forceps and lens after its delivery. If the vitreous is fluid and there is escape of a fairly large amount, warm saline is introduced into the eye until the collapsed cornea regains its normal curvature.

The operation avoids astigmatic cornea, secondary glaucoma from incarceration of iris or capsule, and secondary cataract. It is less painful than the anterior flap operation and the operator is comparatively independent of the patient's will.

In the discussion, Tewfik reported that he had examined four of the cases operated upon and that in one of them he had found multiple posterior synechiae and organized exudate in the pupillary area. In another there was incarceration of uveal tissue all along the scleral wound and detachment of the retina. He pointed out, as complications to be expected, trauma of the ciliary body, loss of the lens in the vitreous, and escape of soft cortical matter into the vitreous if rupture of the capsule occurred. *Edna M. Reynolds.*

Ferrer, H. **Tonometry before and after cataract extraction.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, March, p. 141. (See Amer. Jour. Ophth., 1932, v. 15, April, p. 324.)

Meyer R. C. J. **The intracapsular extraction of cataract; an analysis of sixty-seven cases as a plea for its wider adoption.** Brit. Jour. Ophth. 1932, v. 16, March, p. 156.

The technique considers the patient's general health, the use of chloral and potassium bromide before operation, complete anesthesia of the eyeball, akinesia of the orbicularis palpebrarum, and control of the eyeball by a superior rectus stitch. The operation includes a conjunctival flap, a limbal incision of 150 to 160 degrees, peripheral iridectomy, and the placing of conjunctival sutures to assure approximation of the limbal wound. Extraction of the lens and its capsule is accomplished with forceps slid to the lower edge of the lens beneath the iris, and following with a tenotomy hook. Out of the sixty-seven cases five were lost and in only thirty-four was removal completed in the capsule.

D. F. Harbridge.

Paez Allende, F. **Absorption of remains in the earlier operated fellow eye, as result of a linear extraction. On lens antigen injections.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, March, p. 136.

The author reports a case of juvenile bilateral cataract in a woman of twenty years, in which, on the day following operation on the second eye, there began rapid absorption of abundant remains which had persisted unchanged for a month after discission on the first eye.

Following up the work of Marquez and others, the writer has succeeded in promoting absorption of lens remains by means of subcutaneous injection of emulsions of lens nucleus. Two c.c. of an emulsion of one nucleus, extracted from persons free from lues and other transmissible disease, in four c.c. of normal saline solution are injected the first and second days following operation, and repeated if necessary. The injection also controls inflammatory reactions after all extractions except the intracapsular ones. Action of antigen is believed possible only when the capsule is opened, and is negative with intact capsule. *M. Davidson.*

10. RETINA AND VITREOUS

Atkinson, W. S. **Angiomatosis retinæ with cerebellar cyst. (Lindau's disease).** Arch. of Ophth., 1932, v. 7, April, pp. 510-514.

That the association of angioma of the retina with angiomatosis and cystic lesions elsewhere, as well as its familial tendency, are rarely recognized by ophthalmologists is evidenced by the case of Cushing and Bailey, where such a relationship was missed by at least eight competent ophthalmologists. Cushing and Bailey eventually reported the case as the first to their knowledge in which histological diag-

nosis of the cerebellar lesion had been made during life. The authors report a second case of similar nature in a male aged thirty-two years. The right eye showed an enormous superior temporal vein ending in a large angiomatous tumor well out in the periphery, a picture typical of Hippel's disease. The accompaniment of a cerebellar cyst, with angiomatous areas in the cyst wall, establishes the case as one of Lindau's disease, despite the fact that no other members of the same family have been found with similar lesions.

M. H. Post.

Barrada, M. A., and Tobgy, A. F. **Report on some central affections of the fundus.** Bull. Ophth. Soc. of Egypt, 1931, v. 24, pp. 98-103.

Four cases of inflammatory lesion of the macula in patients ranging from thirty-five to forty-eight years of age are presented by the authors, two showing slight changes and two showing marked changes. All improved under treatment with intravenous injections of collosol-iodin. In the first case the macula appeared opaque and edematous, with two grayish yellow spots, and the macular reflex was absent. Vision was 6/24, which improved to 6/9 after antrum lavage and the injections. After a three-month interval, during which time the patient had treatment for an intestinal infection, his vision was 6/6 and the macula appeared normal except for a few fine yellow spots. The second case showed an edematous macula, finely mottled, with a small gray patch above it and reflexes absent. Vision of 6/24 improved to 6/12 after extraction of bad teeth and an operation on an infected frontal sinus, plus injections. At the conclusion of treatment, the macula was still brownish-gray and slightly edematous. In the third case the macular region showed an area of 2.5 disc diameters slightly raised and brownish-gray in color. At the upper and temporal border a few discrete yellowish drusen were visible. No septic focus was found. Vision, counting fingers at a few centimeters, improved to 6/18 with correction after injections. There was no edema of the macula at the completion of the treatments but the region still appeared slightly grayish. The fourth case showed a circumscribed slightly raised grayish-brown area three disc diameters wide. After treatment of a sinus infection, and the injections, vision had improved from 1/60 to 6/24 in the third week and the edema of the macula had subsided. Such cases are to be differentiated from the preretinal edema of Guist, in which abnormal reflexes are present and the vision is not much affected, and also from shallow detachment of the retina, in which the course and color of the vessels aid in the diagnosis.

Edna M. Reynolds.

Colajanni, G. **On the surgical cure of retinal detachment.** Lettura Oft., 1931, Dec., p. 611.

The Gonin cautery-puncture method is considered the best by this author. Regardless of the past success of the method used, it is insufficient unless general care is associated with the local treatment. The author regards osmotic changes resulting from altered renal permeability as the cause for this condition.

F. M. Crage.

Colenbrander, M. C. **Tables and observations on the accurate localization of retinal tears.** Graefe's Arch., 1932, v. 128, p. 80.

Most of the authors reporting a method for the determination of the position of a hole in the retina neglect the distance of the gap from the sclera. To fully establish this position, particularly in prominent detachments, it is necessary to determine the entire course of the ray along which the tear is observed and then to determine upon this ray the point where the hole exists. Salzmann was right to advise against the use of the nodal point in the determination of the course of oblique rays; it is better to use a second nodal point, practically at the middle of the pupil.

Figures of the distances from the limbus to the point on the sclera nearest the retinal tear are listed in a table by the author as varied by the differ-

ent angles for each ten degrees from 0° to 80° that the ray from the retinal hole makes with the horizontal plane, and also as influenced by apparent depths of the anterior chamber of 2, 3, and 4 mm. and by radii of corneal curvature of 7, 8, and 9 mm. Figures of the distances from the limbus to the point on the sclera at which the ray of light from the eye through the second nodal point and through the retinal gap is directed are listed in another table as varied for the quantities above mentioned. *H. D. Lamb.*

Costeff, Harry. **A study of the eye findings in a group of epileptics with reference to the mechanical theory of epilepsy.** Amer. Jour. Psychol., 1932, v. 11, Jan., p. 747.

Of 114 epileptics fifty-eight cases showed distinct eye pathology, and eight could not be examined. The most frequent pathology found was venous engorgement with otherwise normal fundus, 55.1 percent of the total pathologic cases. Of the remaining cases showing some pathology, sixteen cases showed optic atrophy, eight showed choroiditis, and two a retrobulbar neuritis. Temple Fay's theory of increased intracranial pressure as the cause of epilepsy is reviewed. The work of Kalt, Claude, and others on the the relation between intracranial pressure and the pressure in the retinal vessels is also referred to. The conclusion is reached that the relatively frequent incidence of passive hyperemia in the fundus of epileptics would tend to prove the existence of intracranial hypertension in at least a considerable number of cases. *M. E. Marcove.*

Griffith, H. M. **Asteroid hyalitis.** Pennsylvania Med. Jour., 1932, v. 35, Feb., p. 301.

After reviewing the literature the author describes two cases of asteroid hyalitis. In both the condition was limited to one eye. Both patients were males, one sixty-eight and one fifty-three years of age, laborers. Both complained of floating opacities before one eye. The vision in each case was 6/6 with correction. There was no associated ocular disease. With the slit-lamp the opacities appeared to be perfectly round, homogeneous, and dead white in color. *M. E. Marcove.*

Isakowitz. **Bilateral recent annular opacity of the vitreous (senile vitreous ring, Vogt).** Klin. M. f. Augenh., 1932, v. 88, March, p. 369. (Ill.)

An emmetrope of fifty-seven years had noticed nine months earlier in the right eye and three months earlier in the left eye a ring-shaped shadow, each caused by a symmetrical annular opacity, through the center of which one could see the details of the fundus as through a window. The opacities were doubtless of constitutional origin, but whether in relation to Cloquet's canal or ring-shaped detachment of the vitreous from the disc remained undecided. They were best seen with from plus 8 to 10 diopters, that is, they fluctuated at about 3 mm. in front of the retina. The right ring had a veil-like appendix. Vision = 6/6. With the slit-lamp the vitreous showed signs of destruction. *C. Zimmermann.*

Mayer, L. L. **Detachment of the retina and surgical therapy: an experimental study.** Arch. of Ophth., 1932, v. 7, April, pp. 499-509.

With a view to finding out exactly what occurs when a detached retina is treated according to the Gonin technique, the author has worked out a method of producing detachment of the retina in animals, treating the detachment by several different methods and observing the results pathologically. Under ether anesthesia a rabbit's eye is rotated upward and the conjunctiva incised down to the sclera; an incision from 1.5 to 2 mm. in length is made through the sclera, choroid, and retina in such a way that the vitreous is disturbed very little if at all. A thin spatula is then inserted between the retinal and choroidal coats, separating the layers by a backward sweeping motion. The eye is then treated with Paquelin cautery, potassium hydroxide stick, diathermy, or trephining.

The impressions derived from this

study are that the retinal tear or hole is not the only factor in maintaining detachment of the retina, and that although reattachment occurs following the use of the cautery, there is marked destruction of tissue in the neighborhood of the wound. Methods which do not cause such extensive destruction, but produce an exudate that seals the retina to the choroid, might be preferable to those now in use.

M. H. Post.

Montanelli, Gino. **On the action of subconjunctival injections of phenol.** Lettura Oft., 1931, Nov., p. 555.

The beneficial effect of injection of one c.c. of one percent phenol subconjunctivally was observed in the second recurrence of a large vitreous hemorrhage in an otherwise fairly healthy man aged thirty-three years. No cause for the hemorrhage could be found. Each attack reduced the vision to light perception, after which there was a return to normal. Subconjunctival injections of sodium chloride had been used at the first recurrence. The phenol or irritative treatment was used because the milder procedures did not produce a permanently beneficial effect. The phenol produced considerable transient edema of the lids and bulbar and palpebral conjunctiva. Severe headache was complained of. Absorption of the hemorrhage was rapid, as was the return of vision.

Microscopic examination of the eyes of rabbits previously injected showed no destructive changes locally or in the adjacent tissues. Vasodilatation, congestion, and intense movement of the chromatophores occurred in the iris. Locally there was a mesenchymal reaction with increased eosinophiles in the subconjunctival tissues.

F. M. Crage.

Sobhy Bey, M., and Tobgy, A. F. **A case of macular degeneration.** Bull. Ophth. Soc. of Egypt, 1931, v. 24, pp. 104-105.

The patient was a male aged thirty years, who gave a history of poor vision in the right eye since childhood and diminution of vision in the left eye following two attacks of severe headache several years previously. The right macula showed a whitish-gray patch with irregular borders and no reflexes. The left macula appeared slightly darker than the rest of the fundus and was mottled with fine pigment. Positive physical and laboratory findings were as follows: mild positive Pirquet reaction; urine positive for albumin and red blood cells; x-ray showed bilharzial changes in left ureter and bladder. Under treatment of the urinary condition the patient gained weight, and the macular lesions remained stationary.

Edna M. Reynolds.

Sobhy Bey, M., and Tobgy, A. F. **Unilateral persistent hyaloid artery.** Bull. Ophth. Soc. of Egypt, 1931, v. 24, p. 108.

A case report of persistent hyaloid artery extending from the disc to the posterior surface of the lens is accompanied by brief discussion of the frequency of total and partial persistence of the hyaloid artery.

Edna M. Reynolds.

Velhagen, K., Jr. **Formation of tears in secondary detachment of the retina, and a contribution to detachment in juvenile emmetropes,** Klin. M. f. Augenh., 1932, v. 88, March, p. 377.

Five cases of juvenile detachment of the retina in emmetropes are described and compared with those given in the literature. Tuberculous origin is considered probable, and it is shown that these secondary types may present retinal gaps. In such cases the therapy is at first conservative and in the second place surgical. *C. Zimmermann.*

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Barrada, M. A., and Tobgy, A. F. **A case of coloboma of the optic discs.** Bull. Ophth. Soc. of Egypt, 1931, v. 24, p. 106-107.

A case of coloboma of the optic discs is reported and this condition is differentiated from crater, from peripapillary ectasia of the sclera including the

entrance of the optic nerve, and from glaucomatous excavation.

Edna M. Reynolds.

Doyle, G. F. **A case of oculoglandular tularemia with bilateral optic neuritis, resulting in complete blindness.** Kentucky Med. Jour., 1932, v. 30, March, p. 137.

The author believes this to be the first reported case of oculoglandular tularemia in which there was involvement of the optic nerve. A woman sixty-one years old cut her finger while dressing a rabbit which had been accidentally killed by an automobile. Before washing her hands she rubbed her eyes. The next day she had a severe chill, and fever which lasted for four days and sometimes reached 105 degrees. Part of the time she was delirious. On the sixth day a deep ulcer developed on the wound. The axillary, cervical, preauricular, and submandibular glands became swollen and tender. Simultaneously with the appearance of the ulcer on the finger, the left eye became inflamed and very painful. The lids were swollen and there was a profuse purulent discharge. The vision in this eye became markedly impaired. The next day the right eye became involved in the same manner. The vision became progressively worse until eight weeks later she was totally blind. The swelling of the lids and the discharge continued for five weeks and gradually disappeared. The tension in both eyes was plus. The ophthalmoscopic picture was that of papilledema which was beginning to pass into the stage of atrophy. The condition progressed to complete atrophy of both nerves.

M. E. Marcove.

Hippel, E. **Further on retrobulbar neuritis of nasal origin, with remarks on unusual cases of familial disease of the optic nerve.** Graefe's Arch., 1932, v. 128, p. 23.

To the seventy cases of retrobulbar neuritis reported in 1928, the author is now able to add thirty-six more cases observed between 1928 and 1931. Among twenty-three males in the recent series of thirty-six cases, the cause of the retrobulbar neuritis was multiple sclerosis in nine, familial disease in six, unknown in two, funicular myelitis in one, and in another probably an old encephalitis. Among the thirteen females, the etiologic factor was multiple sclerosis in six and not definitely determined in seven. Nasal examination including x-ray of the sinuses was carried out in thirty cases; in not a single case was any pathologic condition of the sinuses found. As pointed out by Adie, retrobulbar neuritis may precede by as much as twenty-four years the other signs of multiple sclerosis.

Among the hereditary or familial type of retrobulbar neuritis, two pairs of brothers were found to have mothers who were sisters. Of the six males with hereditary disease of the optic nerve, three terminated with preservation of useful sight.

Since both among the seventy cases of retrobulbar neuritis reported in 1928 and in the present series of thirty-six cases approximately seventy percent ended with useful vision, although in none was a nasal operation performed, it is necessary to be cautious in ascribing good results to the nasal operation frequently performed for relief of this ocular condition.

H. D. Lamb.

Lillie, W. I., and Parker, H. L. **Retrobulbar neuritis due to thallium poisoning.** Jour. Amer. Med. Assoc., 1932, v. 98, April 16, p. 1347.

Two cases of retrobulbar neuritis with peripheral neuritis due to thallium poisoning following the use of Koremlu depilatory cream are reported. Absolute central scotoma was present in each eye in each case. Very little improvement in visual acuity was seen during the seven months' observation in either case, and the authors feel that a very substantial reduction in central vision will result. (Four figures.)

George H. Stine.

Puscariu, Elena. **Observations of rare cases of ocular syphilis.** Arch. d'Opht., 1932, v. 49, Jan., p. 37. (See Section 10, Retina and vitreous.)

Scales, H. L. **Amblyopia in pneumonia after ethyl hydrocuprein (optochin base).** Jour. Amer. Med. Assoc., 1932, v. 98, April 16, p. 1373.

In this case there was rapid and complete loss of vision following the usually recommended dosage of optochin base for three days. At first the fundi were normal, but four days later a large retinal hemorrhage was seen between the macula and the disc in one eye. Ten days later marked retinal edema and almost complete contraction of the retinal vessels were present. No recovery of vision, other than ability to count fingers at four feet, had occurred up to the time of reporting.

George H. Stine.

Swab, C. M. **Amblyopia from ethylhydrocuprein.** Arch. of Ophth., 1932, v. 7, Feb., pp. 268-279.

This paper reports a case of impaired visual function following eight four-gram doses of ethylhydrocuprein administered with milk according to Mendel's directions. The vision was reduced to light perception, the pupils were widely dilated, both discs pale, and the arteries narrowed. Strychnine sulphate was administered and later amyl nitrite and hot compresses. The central vision gradually returned to normal, the blue field was recovering, but the green and red fields remained much contracted in the order named. The author concludes that this case was probably one of idiosyncrasy.

It has been contended that the occasional development of blindness in these cases is the result, not of quinine alone, but partly of the toxic condition for which it is administered. Yet this contention appears to have been answered conclusively in the negative by human experimentation. The attack appears to be upon the vasomotor centers, resulting in constriction of the vessels, possibly through an endovasculitis or even thrombosis, with final extensive atrophy of the visual fibers. Ethylhydrocuprein appears to be more toxic than ordinary quinine. *M. H. Post.*

Vahnin, I. L. **On involvement of the optic disc in traumatic inflammations of the anterior part of the eyeball.** Sovietskii Vestnik Opht., 1932. v. 1, no. 1, p. 15.

In twenty-one cases of traumatic iridocyclitis, pathological examination revealed inflammatory changes of various degrees in the intraocular portion of the optic nerve. The intensity of the papillitis was in direct proportion to the extent and severity of the endophthalmitis. Involvement of the optic nerve was demonstrated even in those cases in which the traumatic reaction was limited to the anterior part of the eyeball without change in the membranes surrounding the vitreous. The author assumes that the infectious toxins may pass through the pupil into the posterior chamber and may then find their way to the optic papilla via the vitreous and the perivascular spaces of the retina.

His contentions regarding optic nerve involvement in traumatic iridocyclitis were corroborated experimentally by infecting rabbits' eyes with the staphylococcus. *M. Beigelman.*

12. VISUAL TRACTS AND CENTERS

Colapinto, G. **Homonymous hemianopsia cured by injection of acetylcholine.** Ann. di Ottal., 1931, v. 59, Sept.-Oct., p. 883.

The case reported is that of a woman of thirty-eight years who for from four or five years before the present attack at intervals occurring from a few days to a few months had been subject to attacks of ophthalmic hemicrania, usually lasting for about fifteen minutes, sometimes associated with scintillation, and at other times a black veil covering the sight. Two years earlier she had had paralysis of the right superior artery, with vertigo and an aphasia which continued for fifteen days without loss of consciousness, but with clearly defined hemianopsia. Diagnosis was made of an arterial spasm in the cortical and subcortical region of the optical tract, as previously a spasm of the left Sylvian artery had produced aphasia. The fields gradually enlarged under the action of the drug.

Park Lewis.

Compton, M. L. **Oculogyric crises in chronic epidemic encephalitis.** Med. Bulletin of the Veterans' Administration, 1931, v. 7, Dec., p. 1150.

Compton adds two more cases to 200 previously reported. The patients were soldiers. The condition of each was unchanged by hyoscin, but was favorably influenced by atropin and placebos. Fear and anxiety seemed to bring on the attacks. (Four references.)

Ralph W. Danielson.

Holmes, Gordon. **A contribution to the cortical representation of vision.** Brain, 1931, v. 54, Dec., p. 470.

During the war the author had the opportunity of examining several hundred men with gunshot wounds of the occipital lobes. One striking observation made during the early stages of such wounds was that although the wound apparently was limited to one hemisphere the blindness extended into the homonymous ipsolateral fields. The loss of vision was almost always along the vertical axis through the fixation point, and generally became wider toward the upper or lower limit of the field. The author called these sector scotomata. After observing a certain number of such cases it was found that such sector scotomata were generally caused by relatively large missiles of low velocity which had entered one occipital lobe obliquely and had been arrested by the falx separating the two occipital lobes. The author concluded that a sector-like scotoma on the side corresponding to the wound was due to bruising or other damage of that portion of the calcarine area exposed to the mesial surface of the opposite hemisphere where this lies in contact with the falx. In other cases it was found that injury through the falx immediately above the level of the posterior calcarine fissure produced, in addition to a homonymous paracentral scotoma, a right-sided sector scotoma extending from the fixation point downward. From these and other observations, the author concludes that those portions of the retina which lie along the vertical meridian are represented on the exposed mesial surfaces of the occipital lobes, and by exclusion that the retina along the horizontal meridian is projected on to that part of the area striata which lies deep in the walls of the calcarine fissure. A case is reported in which the visual field changes showed a partial left homonymous hemianopia, the striking feature of which was that although the blindness came up to the fixation points along the horizontal meridian there was no scotoma along the vertical meridian in the upper and lower quadrants. At autopsy a hemorrhage was found deep in the calcarine fissure.

M. E. Marcove.

13. EYEBALL AND ORBIT

Almeida, A. **Voluntary luxation of the eyeball.** Klin. M. f. Augenh., 1932, v. 88, Feb., p. 233. (Ill.)

Three cases occurring in colored people are reported. The flatness of the orbit and the laxity of the fasciæ in this race may be predisposing factors.

C. Zimmermann.

Barrada, M. A. **Two cases of proptosis.** Bull. Ophth. Soc. of Egypt, 1931, v. 24, pp. 109-113.

Two cases of proptosis due to orbital tumors are reported by the author. The first is a case of bilateral proptosis due to chronic inflammatory tissue caused by pansinusitis. The second is a case of unilateral proptosis due to neurofibroma of the optic nerve.

Edna M. Reynolds.

Brain, R. W. **Exophthalmos of central origin.** Brit. Med. Jour., 1931, Nov. 21, p. 937.

By the above title, the author refers to exophthalmos occurring in connection with signs definitely pointing to an organic lesion of the central nervous system. The exophthalmos may be associated with supranuclear lesions or with external or internal ophthalmoplegia. It may be either unilateral or bilateral and may be associated with lid retraction or with ptosis. There may be lid retraction on one side and ptosis on the other. Enlargement of the thyroid

occurs in about fifty percent. There may or may not be disturbance of sugar metabolism. On clinical grounds alone the author states that the lesion is usually situated in the midbrain.

M. E. Marcove.

Busacca, A. **Phlegmon of the orbit.** Riv. Oto-Neuro-Oft., 1931, v. 8, Nov.-Dec., pp. 481-516.

Eight cases of phlegmon of the orbit are reported, which occurred among 25,000 eye cases treated at the ophthalmic division of the Ospedale Maggiore of Bergamo. The age of the patients, one of whom was a girl, varied from thirteen to twenty-seven years. Two cases had nasal origin, two dental, one originated from a periostitis of the frontal bone, two were a result of trauma with fracture of the orbit, and one showed no evident cause. Staphylococcus, the streptococcus, the pneumococcus and the bacillus coli were found. From the point of origin the infection spread either toward the superior, the nasal, and the inferior walls of the orbit or toward the apex and the cranial cavity. Among the ocular complications the author found edema of the conjunctiva and cornea, lagophthalmic keratitis, mydriasis which denoted paralysis from compression of the third nerve at its entrance into the orbit or from compression of the ciliary ganglion, papilledema or peripapillary edema of the retina which denoted compression or intoxication of the optic nerve, and thrombosis of the central vein in connection with thrombophlebitis of the orbital veins. Among extraocular complications he found abscesses of the lids, abscesses of the orbit, cellular infiltration around the optic nerve and its sheaths, and destruction of the nervous elements by fibrinous exudation either in front of or behind the lamina cribrosa. The disease lasted from twenty days to three months, with complete recovery in three cases. One patient suffered partial loss of the sight and another loss of the eyeball. Three patients died, one as the result of septic meningitis, one from pyemia, and one from abscess of the brain. (Bibliography and 10 figures.)

Melchiore Lombardo.

Chou, C. H., and Reiss, F. **Coccidioidal (immitis) endophthalmitis.** Nat. Med. Jour. of China, 1931, v. 17, Dec., p. 747.

Coccidioides immitis is not related to coccidiosis, being rather a species of fungus. Most of the eighty cases of this infection that have been reported were from California. Including the present case the eyeball has been involved in only three instances. The organism may enter the body by the respiratory tract, the alimentary tract, or the skin. Most cases end fatally. The present case occurred in a foundling. At two months, when picked up by the adopted mother, the child was very much emaciated and was covered with various kinds of skin lesion. The skin lesions cleared up except for one over the external surface of the left thigh. At the age of six months there was a metastasis to the left eye, so that two weeks after onset of the symptoms there was a typical picture of endophthalmitis. The organisms were recovered from the vitreous. After a couple of months the condition resulted in phthisis bulbi. The general condition and the process in the eye were very favorably influenced by administration of emetin. (Twelve references.)

Ralph W. Danielson.

May. **Conservative treatment of pulsating exophthalmos.** Klin. M. f. Augenh., 1932, v. 88, Feb., p. 184. (Ill.).

Three cases are reported. A man aged twenty-seven years had sustained a blow against the left temporal region four years previously. Ligation of the left carotid, after preceding ligation of the jugular vein on account of hemorrhage from an accidental tear during the operation, was followed the same afternoon by paresis of the right facial nerve and motor aphasia of whole right side of the head. These subsided, leaving slight weakness of the right arm and a retardation of speech. The second patient constructed himself a truss-like

collar which he could wear constantly, day and night. After twelve weeks the exophthalmos and pulsation had almost completely subsided. The apparatus, which is here illustrated, means a progress in the treatment. It was also used in the third case, which has not been under sufficiently long observation, but promises a good result. The main point lies in gradual compression of the carotid and consequent retardation of the blood current. *C. Zimmermann.*

Silvagni, M. **Orbital complications from maxillary sinusitis.** Riv. Oto-Neuro-Oft., 1931, v. 8, Nov.-Dec., pp. 517-526.

A boy twelve years old showed marked protrusion of the left eyeball, with limited movements down and outward, as a complication of left maxillary sinusitis of probable ethmoidal origin. After opening of the affected sinuses and drainage of the pus through the nose the patient recovered. A piece of necrosed bone, removed from the roof of the antrum at the time of operation, revealed under the microscope a lamellar necrosis. Extension takes place either through the Haversian canals or by interosseous thrombosis. Another boy, thirteen years of age, beside ocular symptoms and symptoms of polysinusitis showed decayed teeth and mucopurulent discharge from the left nasal cavity and from around the root of the left second upper molar. This case had apparently a dental origin. At operation the bones of the left sinuses and of the orbit were found affected by putrid osteomyelitis. Intracranial complications and septicopyemia followed.

The author considers the young age of the patients as an etiologic factor of the disease and its complications. At this age the process of ossification is not yet completed, the venous system of the bones abounds in bloodvessels and spreading of the infectious process is made easier. Anomalies of development and defects of ossification are important factors. X-ray examination showed an abnormally large antrum in the first case and abnormal development of the posterior sinuses in the second. (Extensive bibliography.)

Melchiore Lombardo.

14. EYELIDS AND LACRIMAL APPARATUS

Baquis, M. **Polyp of lacrimal canaliculus.** Lettura Oft., 1931, Aug., p. 434.

The author describes a case of polyp of the common canaliculus in a patient suffering from chronic purulent dacryocystitis. The patient had been treated with sounds. Histologically the neoplasm was definitely differentiated from inflammatory granuloma. The various stages in the histogenesis of polyp were studied in other cases.

F. M. Crage.

Michail, D., and Vancea, P. **Does there exist an inner secretion of the lacrimal gland?** Graefe's Arch., 1932, v. 128, p. 38.

During the last four years, the authors have been occupied with investigating upon various animals the pharmacodynamic peculiarities of extracts of the lacrimal gland. Three methods of preparing the extract are given in considerable detail. A definite effect was exerted by this extract upon the heart, arteries, veins, capillaries, kidneys, spleen, cerebrospinal fluid, respiration, the muscles of the uterus, those of the intestine, those of the bloodvessels, the secretion of urine, the metabolism, the blood, wound-healing and body development. The authors cannot now definitely answer whether a physiological inner secretory action from the lacrimal gland analogous to that produced by these extracts exists in the organism. *H. D. Lamb.*

West, J. M. **The clinical results of the intranasal tear sac operation.** Trans. Sec. on Ophth., Amer. Med. Assoc., 1931, p. 69.

A brief description of the intranasal tear sac operation is given and the following are among the advantages claimed for this method: The physiologic function of the lacrimal apparatus is reestablished so that not only a dacryocystitis, a lacrimal fistula, or a

phlegmon is cured, but subsequently the tears drain off into the nose, and the troublesome epiphora usually following external operations is avoided. The pathogenic bacteria disappear from the conjunctiva. Treatment with probes is avoided. The entire treatment is usually completed in about a week. West does not consider the modifications of his procedure to be advantageous. (Six figures. Discussion.) *George H. Stine.*

15. TUMORS

Alexander, B. **The pathology of melanosis and of benign melanomas of the ciliary body.** Arch. of Ophth., 1932, v. 7, April, pp. 521-537.

Benign melanomas are circumscribed, sharply defined, pigmented, tumor-like areas, as distinguished from the general ocular melanoses and local diffuse pigmentation which occasionally occur in the form of streaks. Eight cases in all have been described in the literature. Only three were of the circumscribed, sharply defined type. The author's case falls in this group.

A definitely pigmented, sharply defined, tumor-like mass was accidentally found on section. It occupied the entire width of the ciliary body, causing it to bulge into the vitreous. Dense pigmentation obscured the structure. No hemorrhages were found. The pigment was apparently melanin, produced by the cells themselves, which resembled chiefly benign melanoblasts, bearing more resemblance to epithelial than to connective-tissue cells. The general character of many of the cells present pointed to an epidermal or neuroepithelial origin. There was no suggestion of relationship with neurofibromatosis. In this particular instance there was a large amount of fibrillar hyalin connective tissue present, showing a connection with nevi of the skin. A second feature, indicating a relationship with nevi of the skin, was the striking reaction of the elastic tissue to the tumor growth. Here and there elastic fibrils could be seen to continue with but little destruction through the whole length of the tumor, though bulging apart in places, this behavior indicating that the tumor arose from various foci of proliferation, rather than from one central point. It was impossible to determine how long the nevus had been present. The author believes that a certain relationship exists between chronic inflammation and the formation of such melanomas of the ciliary body. *M. H. Post.*

Berliner, M. L. **Cysts of the cornea.** Arch. of Ophth., 1932, v. 7, Feb., pp. 224-240.

Only fifteen cysts of the cornea have been described, to which number the author adds one more. They may be classified according to location, lining, or conformation. Looked at from the point of view of the first classification, these cysts may be precorneal, intracorneal, or postcorneal. The first of these are by far the most common. They may be lined with: (1) epithelium (a) derived from the corneal surface, the type most frequently recorded, or (b) from the bulbar conjunctival epithelium; (2) endothelium; (3) pigment epithelium of the iris; (4) tissue of uncertain origin. From the standpoint of conformation, they may be monolocular or multilocular. Brief abstracts of the fifteen previously reported cases are given. *M. H. Post.*

Burch, F. E. **Orbital metastases from malignant tumors of the suprarenal.** Arch. of Ophth., 1932, v. 7, March, pp. 418-433.

Suprarenal gland tumors may arise either from the medullary or the cortical portion of the gland. They frequently metastasize to form orbital or intraocular tumors. With them are associated true hypernephroma, or malignant nephroma, which originate from suprarenal rests in the kidney. In the eye, their presence is indicated by orbital hemorrhage, proptosis and echemosis of the lids, often associated with optic neuritis and blindness. Secondary anemia, cachexia, and exhaustion are marked. Practically all patients have died within six months. Medullary suprarenal tumors occur between the ages of two weeks and ten

years, metastasis apparently occurring through the lymph stream. These tumors must be differentiated from chloroma, scurvy and trauma. In the author's case the growth was shown at autopsy to have originated in the cortical epithelium of the suprarenal gland. *M. H. Post.*

Butler, T. H. **The treatment of limbal tumors with radium.** Brit. Jour. Ophth., 1932, v. 16, March, p. 152.

The author reports on six patients with limbal tumors, all treated with radium and all making complete recovery. The first, a female, showed a sessile tumor measuring 5 mm., which proved to be an hemangioma. The second, a female aged eighteen years, had a limbal sarcoma 3 by 7.5 mm. The third, a female aged fifty-seven years, had a melanotic malignant growth with widespread conjunctival invasion. The fourth, a female aged twenty-three years, had a melanotic carcinoma. The fifth, a female aged twenty-five years, had a hemangioma. The sixth case was one of limbal sarcoma.

D. F. Harbridge.

Callender, G. R. **Malignant melanotic tumors of the eye: a study of histologic types in one hundred and eleven cases.** Trans. Amer. Acad. Ophth. and Oto-Laryng., 1931, p. 131.

The director of the Division of Ophthalmic Pathology of the American Registry of Pathology at the Army Medical Museum reports on his study of specimens sent to the Museum for diagnosis during nine years. In 1770 eyes examined, 111 malignant melanotic tumors were found, and subsequent histories were obtained from most of those sending specimens. Four classes of tumor could be distinguished histologically: (1) The spindle-cell type. This was divided into subtype A, in which the cells were pointed, showed no definite nucleoli and were arranged in all directions; and subtype B, in which the cells were blunt at one end, which was directed toward a vessel. Less intracellular substance was present, and the cells showed distinct nucleoli. Thirteen cases of subtype A and twenty-two of subtype B were found. In neither group have any deaths been reported as due to the tumor or its metastases. Less pigment was found in the tumors of subtype B. (2) Epithelioid type. These showed a predominance of either large or small cells with distinct nucleoli and usually much pigment. Ten cases were reported, with three deaths. (3) Fasicular type. In structure this resembles more an endothelioma. Only six tumors of this type were found, of which two have resulted fatally. (4) Mixed-cell type. This showed a predominance of two or more different types in different parts of the tumor. It was the most frequent type seen, and of sixty patients fifteen died; eleven showed extension into the orbit at the time of enucleation. Among the 111 cases, twenty deaths have occurred. Dr. Callender concludes that the prognosis for life is better in tumors of the spindle cell type. *George H. Stine.*

Goldstein, I., and Wexler, D. **Spongioneuroblastoma of the optic nerve in neurofibromatosis (Recklinghausen).** Arch. of Ophth., 1932, v. 7, Feb., pp. 259-267.

Up to the present time no authentic report of optic nerve tumor in association with neurofibromatosis has been made. The case reported in this paper presented such a tumor in association with generalized neurofibromatosis. A portion of the left optic nerve was involved, the nerve bundles being greatly swollen within the pia, and occupying about two-thirds of the total area of the nerve. Two types of cell occurred prominently, neither being like those usually described for glioma. The larger cells apeared to be neuroblasts, and the smaller cells spongioblasts; wherefore the name spongioneuroblastoma applied to the tumor. An outline of the histogenetic process concerning these cells is appended. Clinically, the tumor was remarkable in that the patient did not complain of defective vision, nor was exophthalmos present.

The paper closes by pointing out the

absence of fundus lesions in typical neurofibromatosis, but their presence in the allied disease of tuberous sclerosis. These lesions consist of well marked knoblike tumors of the disc and flat swellings in the retina, made up chiefly of cells probably derived from the primary retinal anlage. *M. H. Post.*

Heine, L. **Contribution to the biology of leucosarcoma of the iris.** Graefe's Arch., 1931, v. 127, p. 640.

A greyish-white mass in the nasal part of the iris was transilluminated by the slitlamp and accordingly was considered to be a cyst. After an attempt to puncture the swelling proved it to be solid, part of the growth was drawn out and excised. The tissue was found to be leucosarcoma. Examination of sections from the eyeball enucleated several days after the biopsy was taken showed that in this brief interval, new development of the neoplasm had occurred within the corneal wound, into the adjacent corneal tissue, and into the aqueous humor. On the temporal side, a small fresh nodule of tumor tissue at the pupillary margin and a thin layer of growth on the anterior surface of the iris were observed. A nodule of leucosarcoma cells in the iris angle just under the operative scar was thought to be the primary focus of the tumor. *H. D. Lamb.*

Lindenmeyer, O. **Angioma of the choroid.** Klin. M. f. Augenh., 1932, v. 88, March, p. 339. (Ill.)

Angioma of the choroid is very rare. In most cases it has been found anatomically in eyes enucleated on account of painful hypertension. Only six cases have been described in which an ophthalmoscopic examination had preceded. Lindenmeyer reports the case of a man who in 1919, at the age of twenty-five years, noticed impaired sight of his right eye. In 1924 a tumor of the fundus was found, but the patient did not return. In March, 1931, a greenish-gray flat tumor extended from the temporal margin of the disc over the macula. Vertically and horizontally it measured 3.50 disc diameters and projected from three to four diopters. There was a large central and sector-like upper scotoma, and vision was restricted to hand movements at 0.5 meter. Tension: right 13, left 18 millimeters. *C. Zimmermann.*

Michaïl, D. **Metastatic choroidal adenocarcinoma probably of intestinal origin.** Ann. d'Ocul., 1932, v. 169, Feb., pp. 119-136.

The patient, a man aged sixty-three years, had a blind painful eye, the beginning of symptoms dating back eight months. The general health was good. Pathological study of the enucleated eye showed a glandular papilliform choroidal tumor suggestive of intestinal epithelium. There was also a retroscleral mass with the same histological appearance and neoplastic infiltration of the lymphatic sheaths of the vessels and ciliary nerves. Of 129 cases of uveal metastasis reported there are only ten similar to this one in which the primary tumor had remained quiet. Usually a uveal metastasis represents a growth late in the disease. Therapeutically this case demonstrates that one should include deep resection of the optic nerve and surrounding structures to avoid orbital recurrence. The condition is discussed in considerable detail and comparison made with other case reports. (Six photomicrographs, bibliography.) *H. Rommel Hildreth.*

Samuels, B. **Tumors of the orbit.** Trans. Amer. Acad. of Ophth. and Oto-Laryng., 1931, p. 66.

This paper is a brief pathological review of some of the tumors of the retrobulbar space, the so-called concealed tumors, including those of the optic nerve, all of which sooner or later produce exophthalmos. The tumors are classified according to certain peculiarities as follows:

Group 1. Tumors producing marked inflammatory reaction (of slow growth), such as (a) carcinoma, (b) cylindroma.

Group 2. Tumors producing little or no inflammatory reaction (of rapid growth), such as (a) sarcoma, (b) hemangioma, (c) neurofibroma (Recklinghausen's disease).

Group 3. Tumors of the optic nerve, such as (a) endothelioma, (b) glioma.

Group 4. Tumors invading the retrobulbar region by extension from within the globe.

Group 5. Metastatic tumors of the orbit, such as (a) carcinoma, (b) sarcoma (very rare).

Group 6. Inflammatory pseudotumors of the orbit. Two cases of mistaken diagnosis in which exenteration of the orbit was done are reported.

Group 7. Enigmatic; cases of exophthalmos which anatomically divulge no pathology, illustrative of which one case is reported in which cocainization of the nose caused complete disappearance of the exophthalmos.

(Eighteen figures, discussion.)

George H. Stine.

Scheerer, Richard. **A case of glioma with persistent hyaloid artery.** Klin. M. f. Augenh., 1932, v. 88, March, p. 289. (Ill.)

The author describes a slightly progressive endophytic glioma of the retina, which developed between a persistent hyaloid artery and the anterior margin of the retina of a boy aged two years. A cellular membrane covering the whole retina, and agglutination of the sinus of the anterior chamber and the ciliary processes, which at an early stage of the glioma led to hydrophthalmos and chorioretinal induration, suggested toxic influences from the glioma. A sudden hemorrhage from the stretched hyaloid artery caused detachment of the retina from the ora serrata and necessitated enucleation of the eye. In the region of the hyaloid artery independent glioma nests were found, demonstrating that glioma might start from the glial sheath of the hyaloid artery. *C. Zimmermann.*

Szabó. **Cavernous hemangioma in connection with the lacrimal gland.** Klin. M. f. Augenh., 1932, v. 88, March, p. 355. (Ill.)

A woman aged thirty-nine years had observed for three weeks a small blue, not painful, nodule under the left upper lid. Vision was 5/5. After cantho-tomy the tumor, which extended in the subconjunctival tissue to the lower half of the lacrimal gland, was enucleated with the latter. Histologically it was a cavernous hemangioma.

C. Zimmermann.

Szabo, Georg. **A case of benign epithelioma of Fuchs starting from the ciliary body.** Klin. M. f. Augenh., 1932, v. 88, Feb., p. 201. (Ill.)

A benign epithelioma of the ciliary body of the right eye of a man aged forty-two years, injured in childhood by a pair of scissors, is described microscopically. This rare tumor was first described by E. Fuchs as benign epithelioma and by Ginsberg as pseudoadenoma. It occurs at the ages of from fifty to eighty years, shows no clinical symptoms, and is incidentally discovered histologically. The diameter of the present tumor was scarcely more than from 0.5 to 1 mm. It started from the unpigmented epithelium of the ciliary body and grew not toward the interior of the eye, but into the ciliary body. The epithelial cells were in trabecular rows, and the interstices were filled with a homogeneous mass. Sometimes the rows of cells were so close together that they gave the impression of glandular tubes, producing the aspect of adenoma. Perhaps the old injury was the stimulating element for the cell proliferation. *C. Zimmermann.*

16. INJURIES

Balcarek, Alfred. **Peculiar cataract (siderosis of the lens?) after alleged trauma.** Klin. M. f. Augenh., 1932, v. 88, March, p. 332. (Ill.)

One and a half years before admittance to the clinic, a man aged twenty years had fallen five meters from a roof, without direct injury of the eye. A year later the vision of the left eye failed, so that he could now only discern dark and light. There was a linear macula only of the superficial layers of the cornea and cataract. Corresponding to the margin of the pupil in maximal mydriasis a regular crown of equal yellowish-brown pigment spots under the capsule were seen. All methods

failed to reveal a foreign body, so that an isolated hematogenous sclerosis of the lens, perhaps from blood effused into the anterior chamber by the accident, was assumed. A very interesting discourse on xenogenous and endogenous (hematogenous) siderosis is presented. *C. Zimmermann.*

Cross, G. H. **Ocular injuries: their treatment.** Arch. of Ophth., 1932, v. 7, March, pp. 357-360.

For removal of all oxidized tissue a small burr is recommended. For caustic soda burns the author recommends the immediate application of officinal glycerite of tannic acid solution. Numerous other injuries and their treatment are dealt with. *M. H. Post.*

Gill, W. D. **Fractures involving the orbit and paranasal sinuses, with special reference to diagnosis and treatment.** Texas State Jour. Med., 1931, v. 27, Sept., p. 351.

This is a very interesting and well written article on fractures of the facial bones which involve the orbit and paranasal sinuses. The diagnosis and treatment are discussed. Inspection and palpation are of more value than x-ray because of the anatomy of the parts. The author stresses the early diagnosis and treatment to shorten convalescence and reduce deformity. Infection frequently follows fractures involving the sinuses. (Discussion.)

M. E. Marcove.

Huber, O. **Diminution of refraction by trauma.** Klin. M. f. Augenh., 1932, v. 88, Feb., p. 230.

The right eye of a boy, after being struck by a chestnut, showed a diminution of myopia of two diopters to emmetropia with vision 1.50, after two weeks and also at the reexamination after six months. In another case myopia of 2.75 D. was reduced to a half diopter of hypermetropia, without change after three years. A third case also showed reduced refraction after contusion. The slitlamp revealed no changes of the lens or of its position. No explanation is given.

C. Zimmermann.

Kiehle, F. A. **Aftermath of cases of intraocular foreign body.** Arch. of Ophth., 1932, v. 7, Feb., pp. 180-185.

In all statistics concerning intraocular foreign bodies, the glaring defect lies in omitting to note the time interval between the accident and the final visual test. Very few studies have been made which report the vision at a greater interval than six months after the trauma. It is impossible to determine from them the condition two or three years later. It is not even definitely established that it might not be better in cases where a foreign particle has lodged in the deeper structures of the eye to permit it to remain there, rather than attempt to remove it. The paper ends with a plea that oculists attempt to observe their patients for a longer period of time in order that some definite data may be obtained on this interesting subject.

M. H. Post.

Löwenstein, Arnold. **Consideration of a case of traumatic corneal swelling, with remarks on the significance of the corneal endothelium.** Graefe's Arch., 1931, v. 127, p. 598.

While shaking out a duster, a woman thirty years old was struck with considerable force in the right eye by the end of the cloth. With pronounced photophobia, pain, flow of tears, and ciliary injection, there was a circular opacity 3 mm. in diameter at about the center of the right cornea. Under the slitlamp, considerable thickening of the uniformly opaque corneal parenchyma was found. Surrounding this thickened area of the cornea, there was visible a golden-yellow reflex with a distinct tinge of green. After forty-eight hours, the thickening, opacity, and golden-yellow circle line completely disappeared; but a fine horizontal vesicular line was found in the corneal epithelium, resembling a fresh herpes inoculation. The author is certain that the corneal opacity was due to a lesion of the endothelium allowing the aqueous to enter the corneal parenchyma.

H. D. Lamb.

Montanelli, Gino. **Cataracta electrica.** Lettura Oft., 1931, Aug., p. 395.

The bibliography on this disease shows that in the greater number of cases the condition is bilateral. The course is rather variable. Disappearance of the lenticular opacity has occurred in two and three weeks in two cases. The great time variability in its appearance and progress is mentioned.

The author cites three cases, two from lightning (one which developed bilateral cataract), and one from electrical shock and flash. The diagnosis and prognosis are of great importance. Usually, punctiform opacities occur at first in the anterior cortical layers. The absence of lens opacities soon after the accident does not remove the possibility of their later appearance, which may occur many months after the accident. This fact is of particular importance medicolegally. *F. M. Crage.*

Montanelli, Gino. **Granuloma of the inferior fornix.** Lettura Oft., 1931, Sept., p. 451.

A large, very dark red, moderately indurated, pedunculated mass was severed from the lower right fornix of a boy aged twelve years. One month previous to its removal, the boy had fallen and struck this eye on a cane. Microscopic examination showed neither a foreign body nor giant cells. The numerous vessels presented completely hyalinized walls. Conjunctival tissue and elastic and muscle fibers were absent. This histologic picture, in so far as it could not be interpreted as angioma or granuloma, prompted the author to include it in a general class which he termed granuloma angiomatoide. To this class, then, belong the cases in which new tissue formation follows conjunctival injury with or without retention of foreign body.

F. M. Crage.

Reuter, C. H. **Eye injuries from Fourth-of-July torpedoes.** Jour. Amer. Med. Assoc., 1932, v. 98, April 9, p. 1266.

Eight cases of eye injury are cited following the use of torpedoes. Several of the injuries resulted in permanent damage to the eyes. In no case was the accident attributable to carelessness or to the use of the torpedo in a manner other than that for which it was intended. The obvious hazard which attends the use of such torpedoes, particularly the danger to innocent bystanders, demands that their sale be prevented. (Two photographs.)

George H. Stine.

Sanna, G. **Persistent intraocular steel foreign body with partial conservation of vision and absence of siderosis.** Lettura Oft., 1931, Aug., p. 421.

The author reports a case of retained steel foreign body, embedded in the sclera just below the papilla, and surrounded by connective tissue. A mild stellate posterior polar cataract complicated the injury. One year after the injury the vision has improved from 1/50 to 3/10.

The lack of immediate reaction following the entrance of a foreign body into the eye is explained by its aseptic nature, but the tissue occupied by it is placed in a state of lowered resistance. Hence the cases of inflammation years after injury.

The question of evaluation of the damage sustained in cases of retained intraocular foreign body is considered of great importance notwithstanding the vision remaining. Central vision and fields cannot be considered alone; there is the possibility of future complications. The two-year period set by law as a limit for such evaluation is insufficient, as proved by two cases in which the vision remained intact for three and nine years respectively, but siderosis and optic nerve atrophy soon followed. In so far as there is no definite time for the appearance of complications, such eyes should be considered functionally lost.

F. M. Crage.

Sherman, E. S. **Prognosis of certain eye injuries.** Arch. of Ophth., 1932, v. 7, March, pp. 361-366.

Workmen's compensation laws have increased the importance of accurate

prognosis in industrial eye injuries. The clearing of corneal scars over a long period of time is remarkable, not only from injuries, but also from ulcers. In small injuries of the lens the opacities frequently clear up entirely.

M. H. Post.

17. SYSTEMIC DISEASES AND PARASITES

Bietti, G. **The action on the eye of toxins originating in the body.** Klin. M. f. Augenh., 1932, v. 88, Feb., p. 169.

Bietti created in rabbits lesions which produced with certainty necrosis of the tissues within the living organism, and by absorption of the resulting products of disintegration he elicited reactive changes in the eye. The artificial lesions consisted in aseptic crushing and burning of muscles with glowing iron plates, coagulation by diathermy, ligation of the neurovascular peduncle of the kidney and appendix, and ultrared radiations, described in detail. The results were relatively constant. There was diffuse or focal infiltration of the uvea, especially its posterior segment, with mononuclear cells, predominantly large lymphocytes. Large areas of the choroid were completely infiltrated, sometimes as early as after five or six days, sometimes later. As the most important result of his experiments the author points out that not only from direct action of bacteria and their toxins but also from aseptic injuries, particularly from the mere disintegration of body tissues, substances arise which must be more than heretofore considered in the etiology of local inflammations.

C. Zimmermann.

Bömer, M. **A case of leprosy of the eye.** Klin. M. f. Augenh., 1932, v. 88, March, p. 329.

A merchant, who had acquired leprosy in Dutch Guiana five years previously, and presented nodules on the arms and legs, in September, 1931, developed scleritis, episcleritis, sclerosing keratitis, and acute iritis. Leprabacilli were found in the scleritic nodules. By symptomatic eye treatment and injections of antileprol (ester of chaulmoogra oil with one percent camphor) the eye affection was cured.

C. Zimmermann.

Cange, M. A. **Ocular manifestations of plague.** Arch. d'Opht., 1932, v. 49, Jan., p. 5.

The author reports in detail the onset of bilateral iridochoroiditis in a man of thirty-one years who was afflicted with the bubonic type of plaque. The iridochoroiditis was of a purulent type and resulted in complete blindness of the individual shortly before his death from the plague. A review of all ocular complications of plague which have occurred shows that secondary iridocyclitis, usually purulent, is the most common serious ocular affection to accompany this disease. When this complication occurs the outcome of the general infection is usually fatal, as it indicates invasion by organisms of high virulence. The conjunctiva may be a portal of entry for bacillus pestis in that the organism may be washed from the conjunctival sac into the pharynx by the tears and make its primary invasion through the mucous membranes in that location. Invasion may occur directly through the conjunctiva, but this is very rare.

In one case of secondary iridocyclitis in a seven-year-old child during the Algerian epidemic, white granules were found on the anterior surface of the iris similar to those described previously as being possibly pathognomonic of leprosy. Anterior chamber puncture revealed a culture of the bacillus of Yersin, so that the conclusion was drawn that the masses were colonies of this bacillus. One must therefore withdraw the supposition that these white granules can be used as a specific diagnostic finding in leprosy.

M. F. Weymann.

Dudinow, O. A. **Echinococcus of the orbit, and trauma.** Klin. M. f. Augenh., 1932, v. 88, March, p. 373. (Ill.)

The left eye of a boy aged eleven years had been kicked by a donkey five years previously and had shown a bluish swelling for two months. A year

afterward a small swelling developed on the medial part of the upper lid, gradually growing to a round tumor extending outside of the muscular funnel into the depth of the orbit, and displacing the eyeball downward and outward. The optic disc was slightly veiled, vision 0.005. The tumor was bluntly extirpated and contained two echinococcus cysts. The blood showed marked eosinophilia. Apparently the trauma had favored the occurrence of the echinococcus in the orbit.

C. Zimmermann.

Kiel, Edward. **Contribution to ophthalmomyiasis.** Klin. M. f. Augenh., 1932, v. 88, March, p. 385.

The left upper lid of a boy aged eight years was red, edematous, and tensely swollen, and the eye could not be opened. Around a bluish spot the surrounding tissue was more infiltrated, but there was no fluctuation. After incision to the orbital septum a whitish foreign body was exposed lying in a blackish capsule, apparently an oëstrus larva. After its removal the wound was sutured, and it healed by first intention. The history revealed that the swelling had commenced four months previously, and had subsided and recurred repeatedly. Probably the larva had entered the skin at the discolored spot. *C. Zimmermann.*

Klauder, J. V. **Ocular syphilis. 2. Factors influencing the localization of syphilis in the eye.** Arch. of Ophth., 1932, v. 7, Feb., pp. 268-279.

The localization of an infection in any specific organ or tissue is concerned with strains of that organism, tissue predisposition, hereditary and racial influences, trauma producing a lowering of resistance, immunologic response, and either psychic or mental stress. The Spirocheta pallida does not appear from experimental study to have a specific ocular or other specific strain. Brown and Pearce, in experimentation on rabbits, found that the lesions followed a cyclic course. The inoculation having been made in the testes and left undisturbed rarely became generalized. But after early or late removal of the infected testes, or insufficient arsenical medication, the generalization of the infection proceeded from bone lesions to the skin, mucous membranes, and eyes. Other experimental evidence appears rather to substantiate the importance of local tissue reaction in the defensive mechanism, and to show that clinically the disease expends itself at any given time in one organ, later becoming active in other organs, pursuing a cyclic course, rather than following the dictates of various specific strains. Recent studies, however, have shown that late syphilis may involve two or more systems simultaneously.

It is now well recognized that insufficient treatment results in interference with the immunologic response of the host and is frequently followed by neurorecurrence. These late manifestations in the eye take the form of neuritis, papillitis, involvement of the oculomotor, abducens, or trochlear nerves, and relapsing iritis. The Jarisch-Herxheimer reaction falls under this category, but is rarely seen, since the practice of initiation of treatment by large doses has been abandoned. In closing the author discusses the subjects of tissue predisposition of varying strains of the spirochete. *M. H. Post.*

Kreiker, A. **A case of ophthalmomyiasis externa.** Graefe's Arch., 1931, v. 127, p. 644.

While a convalescent twenty years old was taking the air at a sanitarium in Debrecen, Hungary, he felt something fly against his eye. When examined ten minutes later in the eye clinic, the eye was considerably injected and on the conjunctiva were many small yellowish-white maggots about 1.5 mm. long and 0.3 mm. broad. It was impossible to remove them with forceps because they anchored themselves firmly to the conjunctiva by means of two strong hooks on their heads. Instillations of kerosene caused their death by suffocation, and thirty-five or more were lifted out with forceps. *H. D. Lamb.*

Maggiore, L. **Signs and ocular symptoms of the syndrome of the sphenopalatine ganglion.** Ann. di Ottal., 1931, v. 59, Sept.-Oct., p. 885.

The valuable work of Sluder in formulating what he termed the syndrome of the sphenopalatine ganglion has not been so widely recognized on the other side of the Atlantic as its importance warrants. This article, which is an extract from a volume in course of preparation by the Valsalva Library under the direction of Bilancioni, describes the condition to which disturbance of the ganglion gives rise, and discusses the ocular symptoms which may be present. These come under two heads, the neuralgic and the sympathetic. After a coryza of variable intensity, which may be only light or may be so intense as to cause an acute ethmoidosphenoidal empyema, comes intense pain extending from the root of the nose and involving the eyes, the teeth, the superior maxillary and sometimes the inferior maxillary. The pain extends backward toward the temples and mastoid and reaches its maximum of sensibility at about 5 cm. above this bone. In severe cases it goes into the occiput and may reach down to the arms and even to the fingers. In the vasomotor form the eyes are red, with intense burning, lacrimation, and running from the nose. Two cases are given in which the ocular symptoms were marked. In one of these the eyes were fixed, giving an impression of exophthalmos, and so painful that the lids could be moved only by the fingers. Differential diagnosis should be made between those conditions involving the nasal ganglion and that of Gasser. The distinctive feature is the prompt relief in the former from the local application of cocaine. In cases of mucous hypertrophy over the ganglion silver nitrate in ten percent solution is most effective.

Park Lewis.

Pelouze, P. S. **Ophthalmologic importance of focal infective prostatitis.** Arch. of Ophth., 1932, v. 7, March, pp. 372-377.

From a large experience the author concludes that certain infective eye conditions are due solely to prostatic infections. In many cases no focus could be found other than the prostate, and upon its elimination the ocular lesion promtly recovered. When an increase in ocular symptoms does not follow manipulation of the gland, the prostate gland may be eliminated as the source of the infection. Treatment of the gland should be conducted with far greater circumspection than where elimination of the infection in the prostate itself is the only result sought. In some cases, indeed, the toxin threshold is so low that it is unwise to pursue any manipulations of the prostate until the ocular condition has reached a stationary stage, or one of definite improvement. The author states that at least thirty-five percent of all men beyond the age of thirty-five years have prostate infection, and that at least seventy-two percent with focal infective symptoms have infected prostates. Between the ages of eighteen and thirty years most prostatitis is gonococcal in origin, but in later life such is rarely the case.

M. H. Post.

Santonastaso, A. **Pathological changes in the eyes in leprosy.** Ann. di Ottal., 1931, v. 59, Sept.-Oct., p. 808.

In Italy there are about three hundred lepers including the endemic and the imported cases. From an ophthalmic standpoint the subject is important. In either the anesthetic or the tubercular form the eyes are involved in varying degrees in different parts of the world, but reaching as high as eighty percent of the cases in Havana, while in Sicily 112 in 130 leprous individuals had ocular complications. In regard to treatment early diagnosis is important. The tissues affected are the cornea in the form of keratitis (punctate, superficial, deep, and diffuse), iritis (nodular, miliary, serous, and acute), the ciliary body (iridocyclitis), the retina, the choroid, and the optic nerves. A number of cases are reported with diacritical observations. The study is to be continued in a succeeding number of the Annali.

Park Lewis.

18. HYGIENE, SOCIOLOGY, EDUCATION, AND HISTORY

Casteran. **Classes for amblyopes.** Arch. d'Opht., 1932, v. 49, Feb. p. 100.

This article stresses the advantages of having special classes for children with subnormal visual acuity. In order to find which children need this type of assistance, routine ocular examinations of all school children should be made as early as possible, and those in whom any defect is discovered should be sent to a specialist for examination and recommendation as to further school work. Cooperation between teacher, parent, and physician is very necessary. Such a school for amblyopes is now in successful operation at Strasbourg.

M. F. Weymann.

Certification of blindness. Brit. Med. Jour., 1932, Jan., p. 208.

This is a report of the committee on the prevention of blindness. The existing methods of certification of blindness are described. At present a doctor is called in to examine the case only when there is some doubt as to malingering.

In 1929 a movement was started in Glasgow to remedy the existing difficulties of blind certification. All supposed blind persons are examined at a specially designated clinic by two ophthalmologists who determine the cause as far as possible and the possibility of treatment. This system has proved satisfactory and it has been taken as a model for the rest of the country. The committee recommends that no one should be registered as blind until he has been examined and certified to be blind by a medical practitioner with special experience in ophthalmology. The definition of blindness accepted by the committee is "so blind as to be unable to perform any work for which eyesight is essential". The committee has also divided blind people into three groups: those whose vision is below 3/60; those with vision between 3/60 and 6/60 in whom the field of vision is considerably contracted but excluding long standing or congenital defects; and those whose vision is 6/60 or better but in whom the field of vision is markedly contracted, especially in the lower part of the field

M. E. Marcove.

Hippel, E. **Clinical observations over extended periods.** Graefe's Arch., 1932, v. 128, p. 1.

In a case of disease of the ocular fundus, the most satisfactory procedure is the representation of the findings in an accurate illustration. Through the assistance of a high-class artist and more recently of photography, the author has in the last ten years been in the position to firmly apprehend all interesting cases in this manner. Many excellent drawings and a few much less distinct small photographs give value to this record of unusual cases, only the merest suggestion of which can be given here.

Among fourteen cases of tuberculous perivasculitis of the retina, some were under observation for sixteen years. In two cases the ocular changes were associated with active pulmonary tuberculosis. The diagnosis of tuberculous papillitis seemed justified in two patients. Under the designation of ophthalmoscopic findings of indefinite significance, the author reports in brief the fundus changes in five of his cases. Eight cases of retinitis stellata with star-figure in the macula are briefly reviewed: lues was the cause in two cases. Reports are made on six highly myopic eyes in four patients on whom extraction of the lens had been performed 20, 21, 22, and 31 years previously: the favorable results had persisted to a remarkable degree, recent severe contusions in two of these eyes had not caused retinal detachments. Two infants with beginning hydrophthalmos each had one eye operated during the first year of life for increased tension. When the first case was examined thirty years later, the tension was normal in each eye, and the vision in the unoperated eye was normal with a concave lens and in the operated eye 0.7 to 0.8 of normal with a concave lens. At ten years of age the second patient showed in the right or

unoperated eye normal tension and 0.2 vision with a concave lens; while the left or operated eye had been enucleated two years before. The author has retained illustrations from seven cases of disciform degeneration of the macula. *H. D. Lamb.*

James, R. R. **Thomas Gataker.** Arch. of Ophth., 1932, v. 7, Feb., pp. 171-179.

The Gataker family first appeared in an entry on the Pipe Roll of Six, Henry II, at Michaelmas, 1159. On December 2,1731, Thomas was apprenticed at Barber Surgeons Hall, and he was admitted to the Freedom on October 5, 1742. At one time he was Governor of Saint George's Hospital. His death occurred at Pall Mall, November 17, 1768. His writings show considerable interest in the eye. He leaned towards couching, rather than extraction, of senile cataract, as he felt the reaction to the latter was so much more severe than that of the former and the chance of infection therefore much greater. *M. H. Post.*

Lewis, Park. **The torch bearers.** Guildcraft, 1931, v. 5, no. 1, p. 15.

This paper calls attention to the fact that scientific ophthalmology is only about a century old, and to the life and work of the outstanding men during that time. Graefe, Helmholtz, Hermann Knapp, Donders, Landolt, and many others are mentioned.

Lewis traces the development of the use of glasses from the time that the work of fitting them was ignored by physicians to more recent times when Risley, Thorington, Jackson, de Schweinitz, and others have insisted that lenses should be made down to ⅛ diopter intervals and the prescription determined with great care by physicians themselves. Many men still living remember when trial cases first came into use. *Ralph W. Danielson.*

Marquez. **The necessity for a rational classification of the causes of blindness.** Arch. d'Opht., 1932, v. 49, Jan., p. 31.

A classification is suggested which considers under one heading the lesions directly responsible for the blindness, and under a second heading the illness which is responsible for this lesion. Both classifications are given in tabular form. It is believed that such a classification is necessary for intelligent prophylaxis and treatment of conditions causing blindness. *M. F. Weymann.*

Meyerhof, Max. **A short history of ophthalmia during the Egyptian campaigns of 1798-1807.** Brit. Jour. Ophth., 1932, v. 16, March, p. 130.

This contribution reviews quite fully the obtainable literature on the subject. Sixty sources of information afford the following conclusions: The ophthalmias affecting the French, Turkish, and British armies in Egypt during the campaigns from 1798 to 1802 and in 1807 were, so far as the rather vague descriptions left by military surgeons allow them to be identified, the same as those which are still prevalent in Egypt; that is, a combination of Koch-Weeks', gonorrheal, and postgonorrheal conjunctivitis with trachoma... The high percentage of blindness was due to gonococcic infections (which in hot climates are transmitted extragenitally).

D. F. Harbridge.

Pillat, A. **Trachoma in China: Proposals for uniform recording and for uniform statistics.** National Med. Jour. of China, 1931, v. 17, Dec., p. 755.

In addition to the points indicated in the title, the author points out that many of the complications, such as pannus, supposed to be more or less pathognomonic of trachoma may be due to other causes. The author says that contrary to the opinion given in most of the textbooks of ophthalmology, scarring very rarely begins in the upper tarsal sulcus. In China at least the first scarring is seen at the upper transitional fold, that is, at the junction of the upper fornix.

Ralph W. Danielson.

Redslob, E. **Trachoma among Alsatian soldiers serving on the Russian front.** Rev. Internat., du Trachôme, 1932, v. 9, Jan., p. 24.

During the great war some 200,000 Alsatian soldiers served with the German armies on the eastern front. Here they lived in close contact, often being lodged with the inhabitants, with a population in which the trachoma index varied from 12.5 to 25 percent. From examination of pension records it appears that only three soldiers contracted the disease. Of these three cases only one was severe and led to deformity. Redslob explains this rarity of infection by the fact that Alsatians are in general refractory to this type of infection. Most of the cases seen in ophthalmic practice in Alsace are in Italians or Poles.

Phillips Thygeson.

Rice, C. E., and Smith, J. E. **Trachoma in Missouri.** Jour. Missouri State Med. Assoc., 1932, v. 29, Jan., p. 13.

This paper is largely for Missouri readers. A pregnant suggestion of the writers is that because of the many relapses in trachoma one should use the word "arrested" rather than "cured". The authors estimate that there are 17,000 active and inactive cases in Missouri at the present time. Of 1154 complete records studied, 88 percent showed the presence of corneal pannus.

Ralph W. Danielson.

Savraitov, A. S. **Blindness in U.S.S.R.** Sovietskii Vestnik Opht., 1932, v. 1, no. 1, p. 1.

The census of the population conducted in 1926 throughout the Union of Soviet Socialist Republics reveals 234,000 totally blind with an incidence of 159.7 to 100,000 residents. The coefficient of blindness is subject to considerable geographic variations; it is generally lower in cities (99.3 to 100,000) and higher in villages (170.5 to 100,000). The Finnic tribe of Bessermians has the distinction of occupying first place among the various ethnographic units as to the relative number of blind people (1594.3 to 100,000). As compared with the previous census of 1897, there is a 37.3 percent decrease in the general incidence of blindness in the territory of Russia. This, according to the author, is due to improved social and economic conditions, to general cultural progress, and to effective prophylactic and therapeutic measures. *M. Beigelman.*

Zimmer, V. A. **Workmen's compensation problems.** Arch. of Ophth., 1932, v. 7, March, pp. 367-371.

In the administration of workmen's compensation acts, in no field is the responsibility greater than in ophthalmology. All cases of ocular injury should be referred to an ophthalmologist. Neuroses and psychoses should only be diagnosed in conjunction with competent neurologists. In head injuries, x-ray examinations should be used and slit-lamp examinations should be made more frequently than is now done.

M. H. Post.

19. ANATOMY AND EMBRYOLOGY

Sondermann, R. **The development of the cornea, sclera, conjunctiva and pupillary membrane as well as of the anterior part of the vitreous.** Graefe's Arch., 1932, v. 128, p. 119.

The author traces in detail the development of the substantia propria and endothelium of the cornea, of the primitive sclera, of the conjunctival and episcleral tissues, of the pupillary membrane, and of the anterior vitreous.

H. D. Lamb.

NEWS ITEMS

News items in this issue were received from Dr. G. Oram Ring, Philadelphia. News items should reach **Dr. Melville Black, 424 Metropolitan building, Denver,** by the twelfth of the month.

Deaths

Dr. George W. McCoy, Los Angeles; aged sixty-one years; died April 21.

Dr. Merrit B. Hook, Denver; aged fifty-seven years; died, April 12, of heart disease.

Dr. Jefferson D. Kiser, Bartlesville, Oklahoma; aged sixty-three years; died, April 14, of heart disease.

Dr. Searle Bewley Gillespie, Johnson City, Tennessee; aged forty-seven years; died suddenly, April 7, of acute dilatation of the heart.

Miscellaneous

Under the will of the late Mrs. M. B. Caswell, the New York Eye and Ear Infirmary will receive $30,000.

The Holmes Memorial Hospital of the University of Cincinnati, Cincinnati, has recently received $3000, from Mrs. Christian R. Holmes, to establish an ophthalmic unit.

On May 26, the Senate specifically exempted "frames or mountings for spectacles or eyeglasses" and "surgical instruments" from the section proposing a tax of ten per centum on jewelry, which section was reinserted in the bill after having been stricken therefrom by the Senate Committee on Finance.

Abadie of France has a new treatment for tabetic atrophy of the optic nerve. It consists of subcutaneous injections of 2mg. of atropine and an intravenous injection of .01 gram of mercuric cyanide. All the patients to whom Abadie applied this treatment found the progression of their atrophy checked, and that there was an increase in their visual acuity.

To prepare teachers and supervisors of children having seriously defective vision, summer courses will be offered by four universities, in coöperation with the National Society for the Prevention of Blindness, as follows: University of Cincinnati, June 18 to July 26; University College, University of Chicago, June 27 to August 5; Teachers College, Columbia University, July 5 to August 12; State Teachers College, Buffalo, July 5 to August 12.

The next International Congress will be held in Madrid from the sixteenth to the twenty-second of April, 1933. Abstracts of papers must be in the hands of the secretary Dr. F. Poyales, Olozága 3, Madrid, by November 1, 1932.

The American Board for Ophthalmic Examinations will hold an examination in Montreal on Monday, September 19, 1932, at the time of the meeting of the American Academy of Ophthalmology and Otolaryngology.

Necessary applications for this examination can be procured from the Secretary, Dr. William H. Wilder, 122 South Michigan avenue, and should be sent to him at least sixty days before the date of the examination.

Dr. H. Maxwell Langdon of Philadelphia, Dr. Mark J. Schoenberg of New York City, and Dr. George H. Shuman of Pittsburgh addressed the convention of the Guild of Prescription Opticians, in Washington, D.C., on May 25.

The royal Hungarian Minister of Public Welfare and Labour offers a prize of 2000 Swiss francs as a reward for an independent work on the subject of the etiology of trachoma. The work in question must signify valuable progress in this sphere.

The jury of award appointed by the Royal Hungarian Minister of Public Welfare and Labour was composed of Dr. Arthur Fergusson MacCallan, London, Dr. Viktor Morax, Paris, Dr. Lugi Maggiore, Bari, Italy, Dr. C. Praus Nitz, Breslau, Dr. Emile de Grósz, Budapest.

The jury awarded the prizes to Ugo Lumbroso, Tunis, and J. Tboriski, Palestine.

Honorable mention was given (in alphabetical order): to Dr. Cattaneo, Sassari; P. Olitsky, New York; Rötth and Kanyó, Budapest; C. Trapezontzena, Moscow.—*Prof. Dr. Emile de Grósz, Budapest.*

Beginning Monday, August 1, 1932, the Department of Ophthalmology of the University of Rochester, School of Medicine and Dentistry, will conduct the Third Annual Summer Graduate Course of lectures and demonstrations in Ophthalmology. The course will cover a period of five days and will end on Friday evening, August 5.

The object of the course is to give, in a brief space of time, a series of lectures and demonstrations of interest to all ophthalmic practitioners and to offer to those in attendance the benefit of observations, not only in ophthalmology but also in ophthalmology in its relation to general medicine and surgery.

The course will be limited to 50 members and will cover ophthalmic surgery, ophthalmoscopy and medical ophthalmology, perimetry and ophthalmic neurology, slitlamp microscopy, ophthalmic myology, pathology, retinoscopy and refraction.

Demonstrations will be given by authorities of national reputation in their particular fields.

The lectures will be conducted before the group assembled as a whole. For clinical instruction, the group will be divided into small sections.

The tuition fee for the course will be $50.00.

Societies

With a general attendance much below normal, the Section on Ophthalmology of the American Medical Association nevertheless held a very successful meeting at New Orleans on May 11, 12, and 13, 1932, under the genial chairmanship of Dr. Harry Friedenwald. Dr. F. H. Verhoeff of Boston, was elected chairman for the ensuing year; Dr. Charles A. Bahn of New Orleans, vice-chairman; and the very efficient secretary, Dr. Parker Heath of Detroit, was reëlected. The weather during the New Orleans meeting was very agreeable, alternating between cloud and sunshine, but without extremes of temperature. The American Medical Association will meet next year at Milwaukee. Those attending the Section on Ophthalmology were greatly indebted to the local committee on arrangements, under the indefatigable chairmanship of Dr. Charles A. Bahn. On the evening of May 11 the eye, ear, nose and throat members foregathered for a dinner-smoker in the charming Patio Royal, amid oleanders in full bloom, magnolias, and fig and banana trees.

Personals

Dr. Albert N. B. Lemoine was recently elected president of the Kansas City Society of Ophthalmology and Otolaryngology.

Dr. Paul Sartain of Philadelphia will sail early in July to be gone until September for his usual summer stay in Europe.

Dr. Samuel Kirkpatrick of Selma, Alabama, was elected president of the Alabama Medical Association in the final session of the 65th annual convention in April.

Dr. and Mrs. Howard Forde Hansell of Philadelphia have sailed for Europe to remain until October. After a protracted stay in Paris, they will spend a month in Vittel before returning to America.

Dr. Wm. Thornwall Davis was honor guest of the Kentucky Medical Society in Louisville on May 16, speaking at the annual dinner of the Society on the "Modern conception and treatment of concomitant strabismus".